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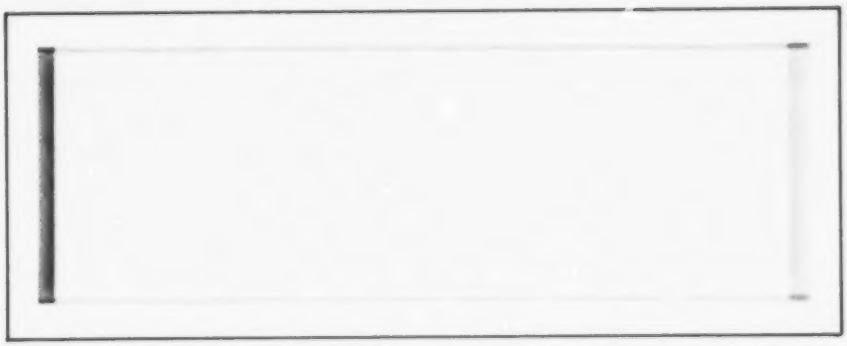

WORKING PAPER

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A PROFILE OF THE CANADIAN DAIRY INDUSTRY AND GOVERNMENT POLICIES

(Working Paper 4/87)

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March, 1987

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SUMMARY

The milk production sector of the Canadian dairy industry is the second most important in terms of cash receipts after wheat. Over 80 percent of the 44,000 milk and cream shippers in Canada are located in Ontario and Quebec. Structural adjustments are leading to fewer but considerably larger dairy enterprises, with average herd size rising from 14 cows and heifers in 1965 to 53 head in 1985. Technological improvements over the same period have resulted in an almost doubling of milk yields per cow. A more-than-doubling of cash receipts per cow from 1965 to 1985 can be attributed partly to technological progress and partly to federal and provincial government policies affecting the dairy industry.

Government policies seek to achieve basic self-sufficiency in dairy products for Canada, while providing reasonable returns to producers and assuring consumers of adequate year-round supplies of good quality products. The principal policy instruments are a) regulation of milk supplies through quotas; b) target returns to milk producers through guaranteed prices to processors and offers to purchase key manufactured commodities, plus direct subsidies to producers; c) regulation of imports of dairy products through tariffs, quotas, licences and embargoes; and d) disposal abroad of products surplus to domestic requirements, funded by producer levies.

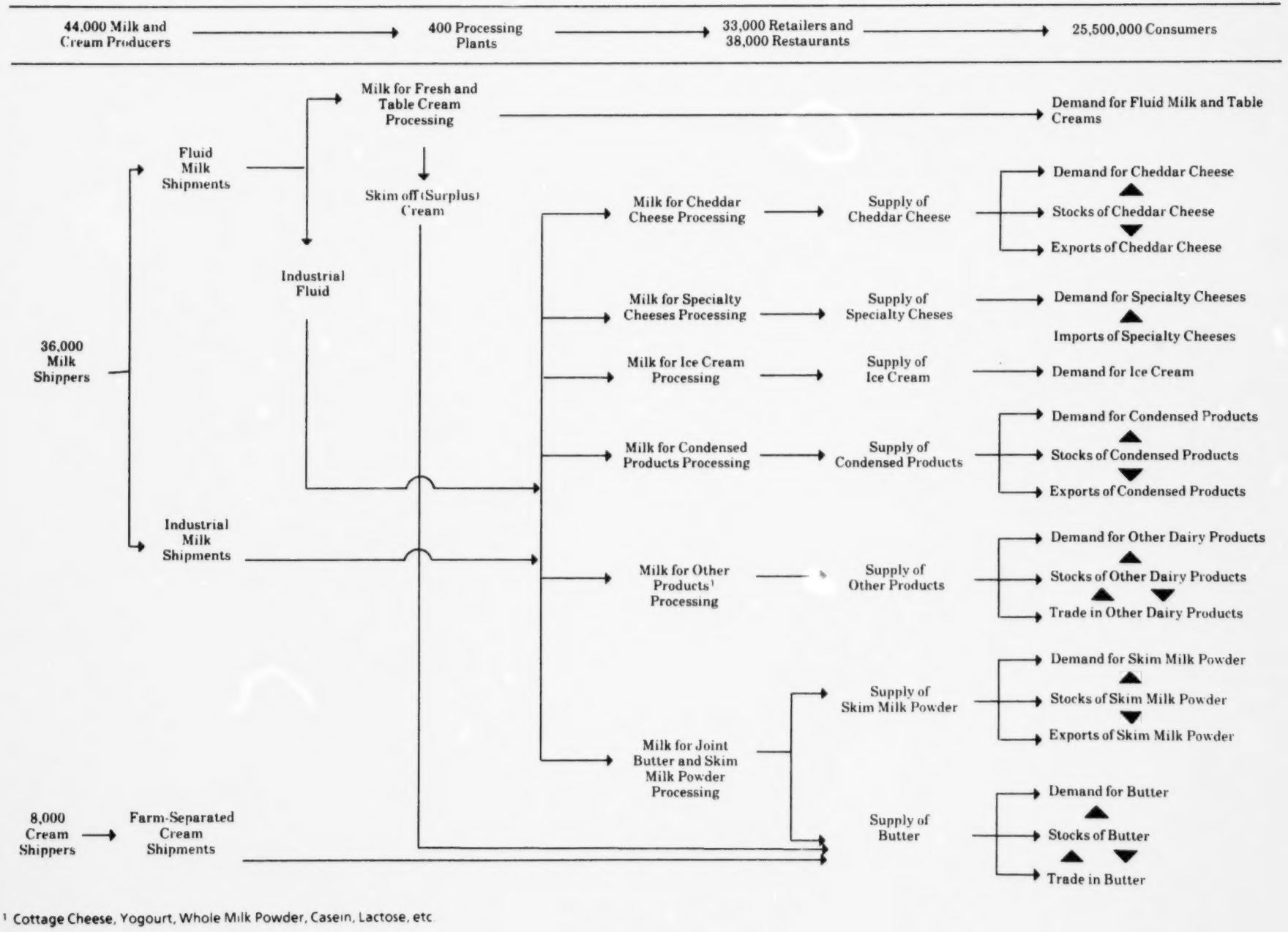
The 400 plants in the milk processing sector provide employment for over 25,000 people and are responsible for transforming 7.25 billion litres of milk and farm-separated cream annually into a wide range of dairy products (Figure 1). Structural adjustments in this sector over the period 1965 to 1985 have led to fewer and larger plants, with additional concentration

of ownership through mergers and amalgamations.

Changes in consumer tastes and preferences are leading to declining trends in per-capita domestic disappearance of standard milk, butter, powdered and concentrated milk products, while domestic disappearance of cheeses, cottage cheese, yogurt, low-fat milks and table creams is trending upwards on a per-capita basis. Aggregate disappearance of fluid milks and table creams is increasing while that for manufactured products as a group is declining slightly.

Canada is a net exporter of Cheddar cheese, and powdered and concentrated milk products, but a net importer of specialty cheeses and casein. Butter fluctuates between a net-export and a net-import basis. Overall, Canada is somewhat more than self-sufficient in dairy products, with exports exceeding imports both in milk equivalent volume and in value terms.

FIGURE 1. AN OVERVIEW OF THE CANADIAN DAIRY INDUSTRY


44,000 Milk and Cream Producers
400 Processing Plants
33,000 Retailers and 38,000 Restaurants
25,500,000 Consumers
Milk for Fresh and Table Cream Processing
Demand for Fluid Milk and Table Creams
Fluid Milk Shipments
Skim off (Surplus) Cream
Industrial Fluid
36,000 Milk Shippers
Industrial Milk Shipments
Milk for Cheddar Cheese Processing
Supply of Cheddar Cheese
Demand for Cheddar Cheese
Stocks of Cheddar Cheese
Exports of Cheddar Cheese
Milk for Specialty Cheeses Processing
Supply of Specialty Cheses
Demand for Specialty Cheeses
Imports of Specialty Cheeses
Milk for Ice Cream Processing
Supply of Ice Cream
Demand for Ice Cream
Milk for Condensed Products Processing
Supply of Condensed Products
Demand for Condensed Products
Stocks of Condensed Products
Exports of Condensed Products
Milk for Other Products[1] Processing
Supply of Other Products
Demand for Other Dairy Products
Stocks of Other Dairy Products
Trade in Other Dairy Products
Milk for Joint Butter and Skim Milk Powder Processing
Supply of Skim Milk Powder
Demand for Skim Milk Powder
Stocks of Skim Milk Powder
Exports of Skim Milk Powder
8,000 Cream Shippers
Farm-Separated Cream Shipments
Supply of Butter
Demand for Butter
Stocks of Butter
Trade in Butter

[1] Cottage Cheese, Yogourt, Whole Milk Powder, Casein, Lactose, etc.

INTRODUCTION

The Canadian dairy industry operates under an interesting admixture of open market forces and governmental intervention. The milk production sector of the industry has a sophisticated set of supply-control and price-setting arrangements, gradually built up over a long period of government involvement; (see, for example, McCormick (1972) and Stonehouse (1979)). The dairy processing sector, which transforms the raw farm product into consumer products, enjoys a smaller measure of security through processing margins theoretically guaranteed by government policy, and through assured markets at guaranteed minimum prices for principal dairy commodities. The distribution and ratailing of dairy products operate outside of any government price and supply policies. Structural adjustments in both the production and processing sectors that have occurred over the last two decades throughly parallel one another. Productivity levels have increased at different rates, but these differences are not invariably large. The milk production sector have evinced the larger increases as measured by both technical productivity and economic productivity.

The purpose of this paper is to present an overview of the Canadian dairy industry and the government policies that affect its operation. This report should be of interest to those familiar with and to those who have little prior knowledge of the industry. It is not the intention here to provide a critique of the industry and the associated government policies.

Some specific objectives to be achieved in this paper are:

1. to assess the size, composition and economic importance of the Canadian industry;

TABLE 1: ECONOMIC IMPORTANCE OF THE MILK PRODUCTION SECTOR OF THE DAIRY INDUSTRY, BY PROVINCE, 1985

	Farm Cash Receipts from Dairying				Total Farm Cash Receipts	Dairy Cash Receipts as % of Total Farm Cash Receipts
	Dairy Products Sales	Cattle & Calves Sales	Government subsidies	Total		
	(mil $)				(mil $)	(%)
Newfoundland	9.41	0.21	-	9.62	42.70	23
Prince Edward Island	27.82	2.58	5.09	35.49	173.35	20
Nova Scotia	72.67	3.49	3.50	79.66	257.95	31
New Brunswick	51.90	2.43	3.76	58.09	221.36	26
Quebec	1,030.76	33.78	133.57	1,198.11	3,149.78	38
Ontario	943.09	131.47	90.02	1,164.58	5,122.67	23
Manitoba	102.61	36.65	10.94	150.20	2,029.47	7
Saskatchewan	75.34	57.37	6.98	139.69	4,209.63	3
Alberta	229.14	142.57	18.58	390.29	3,861.01	10
British Columbia	235.05	17.74	9.90	262.69	972.27	27
Canada	2,777.79	428.29	282.34	3,488.42	20,040.19	17

Source: Statistics Canada, Cat. No. 21-001, Farm Cash Receipts

TABLE 2: NUMBER OF DAIRY FARMS SHIPPING MILK OR CREAM TO DAIRY PROCESSING PLANTS, BY PROVINCE, 1985

	Fluid and Industrial Milk Shippers	Industrial Milk only Shippers	Farm-Separated Cream Shippers	Total Shippers All Types
Prince Edward Island	151	469	256	876
Nova Scotia	625	-	211	836
New Brunswick	532	-	238	770
Quebec	9,009	9,560	25	18,594
Ontario	9,822	1,073	2,240	13,135
Manitoba	1,199	-	1,855	3,054
Saskatchewan	781	56	1,968	2,805
Alberta	1,425	282	1,763	3,470
British Columbia	1,071	9	9	1,089
Canada	24,615	11,449	8,565	44,629

Source: Canadian Dairy Commission

TABLE 3: NUMBER OF DAIRY LIVESTOCK, VOLUME OF MILK AND CREAM SHIPMENTS AND MILK YIELD PER COW, BY PROVINCE, 1985

	Number of Dairy Cows[1,2]	Number of Dairy Heifers[2,1]	Volume of Milk/Cream Shipped off Farms[3]				Average Milk Yield per Cow[5]
			Fluid Milk Shipments	Industrial Milk Shipments	Farm-Separated Cream[4]	Total Shipments	
	('000)	('000)		('000 kl)			(l)
Newfoundland	3.0	0.9	15.2	-	-	15.2	5,066.7
Prince Edward Island	22.6	8.0	13.7	74.3	6.6	94.6	4,185.8
Nova Scotia	36.3	15.2	115.8	52.5	5.7	174.0	4,793.4
New Brunswick	29.0	11.1	69.5	57.1	5.9	132.5	4,569.0
Quebec	690.0	235.0	649.2	2,190.2	0.3	2,839.7	4,115.5
Ontario	530.0	260.0	978.4	1,385.8	96.5	2,460.6	4,642.6
Manitoba	82.0	29.0	110.8	147.5	31.5	289.8	3,534.2
Saskatchewan	84.0	18.0	98.1	95.4	18.2	211.6	2,519.1
Alberta	157.0	44.0	255.7	286.5	24.9	567.1	3,612.1
British Columbia	88.0	33.0	304.3	178.4	0.4	483.2	5,490.9
Canada	1,721.9	654.2	2,610.7	4,467.6	189.9	7,268.1	4,221.0

1. Source: Statistics Canada, Cat. No. 23-203, Livestock and Animal Products Statistics.
2. As of January 1, 1985.
3. Source: Statistics Canada, Cat. No. 23-001, The Dairy Review
4. In milk equivalent terms.
5. Column 6 divided by Column 1.

2. to examine the trends in recent decades in consumer demand for dairy products and in structural adjustments and productivity levels in both milk production and processing sectors of the industry;

3. to provide a general description of government policies and institutional structures and procedures associated with the industry.

SIZE, COMPOSITION AND ECONOMIC IMPORTANCE OF THE CANADIAN DAIRY INDUSTRY[1]

Milk Production Sector

The milk production sector of the Canadian dairy industry represents the second most important source of revenue for farmers after wheat. Cash receitps from milk and cream sales amount to 2,778 million dollars, while cash receipts from sale of cattle and calves are estimated to be 428 million dollars; to those amounts should be added 282 million dollars for supplementary payments paid by the federal government on shipments of industrial milk and cream within quota limits (Table 1). Total cash receipts from all sources for dairying exceed 3.4 billion dollars, and this accounts for some 17 percent of all farm cash receipts for Canada as a whole.

Quebec and Ontario are the most important provinces on the basis of cash receipts from dairying, followed by Alberta and British Columbia. However, the relative importance of dairying,

[1] Data presented are for the most recent period for which they are available.

as measured by the percentage of total farm cash receipts attributable to dairying, provides a different ranking, with Quebec at 38 percent followed by Nova Scotia at 31 percent, British Columbia at 27 percent, and New Brunswick at 26 percent (Table 1).

There are approximately 44,600 milk and cream producers registered with the Canadian Dairy Commission as shippers to dairy processing plants (Table 2). About 8,500 producers (20 percent of the total) ship farm-separated cream only, and these producers are heavily concentrated in Ontario and the three prairie provinces. Cream shipments, in milk equivalent terms, account for only about 2.5 percent of total milk and cream shipments, and only about 4.0 percent of total industrial milk and cream shipments. With the numbers of shippers and total cream shipments declining both absolutely and relatively to the number of milk shippers and total milk shipments, the farm-separated cream sector is considered to be of decreasing importance.

The 36,000 or so shippers of milk are distributed across all provinces, but over 80 percent of them are to be found in Ontario and Quebec. The three prairie provinces are the next most important, collectively accounting for a further 10 percent of registered producers (Table 3, columns 1 and 2). British Columbia has an average herd size well above the national average, so that although this province ranks sixth largest in number of farms, it ranks third in number of dairy cows. The heaviest concentration of dairy heifers (defined as female stock, one or more years of age, being raised mainly for milking purposes) is in Ontario, which features not only the largest absolute number of heifers but also the highest ratio of heifers to dairy cows (49 percent). This is indicative of the degree to which Ontario has concentrated on developing a dairy livestock replacement industry, one that figures prominently in Canada's exports of dairy livestock.

The national dairy herd produces over 7.25 billion litres of milk and farm-separated cream (Table 3, column 6). Some 36 percent of that total is shipped as fluid milk (Table 3, column 3), while farm-separated cream comprised only 2.6 percent of total (fluid and industrial) shipments (Table 3, column 5). Because there is little interprovincial shipment of fluid milk and table creams, the distribution of fluid milk shipments among the provinces approximates reasonably well the population distribution. In contrast, industrial milk shipments are concentrated most heavily in the two most populous provinces. Alberta is a distant third in importance as an industrial milk products shipping province.

Milk production per cow varies widely among the provinces. The highest provincial average is in British Columbia (5 491 litres), and this is more than twice the lowest provincial average (Saskatchewan at 2 519 litres); the national average is 4 221 litres per cow (Table 3, column 7). One of the factors influencing interprovincial differences in milk yield per cow could be differences among provinces in unit prices paid to milk shippers.

Milk Processing Sector

The 7.27 billion litres of commercial milk and cream shipments are transformed into a wide range of dairy products through 400 processing plants that provided employment for over 25 000 people and over half a billion dollars in gross salaries and wages (Table 4, columns 1, 2 and 3). The value of dairy products manufactured in these plants exceeds 5.6 billion dollars, while the value added in the process of manufacturing the products is almost 1.5 billion dollars (Table 4, columns 4 and 5).

The provincial distribution of dairy processing plants and associated economic activity is similar to that for milk

TABLE 4: SIZE AND ECONOMIC IMPORTANCE OF THE PROCESSING SECTOR OF THE DAIRY INDUSTRY, BY PROVINCE, 1983

	Number of Dairy Processing Plants	Total Number in Labour Force[1]	Salaries and Wages Paid	Value of Shipments of Goods of Own Manufacture	Total Activity Value Added
			(mil $)	(mil $)	(mil $)
Newfoundland	6 (6)	238	4.6	31.8	13.6
Prince Edward Island	14 (6)	365	6.4	67.3	13.3
Nova Scotia	15 (7)	1,313	25.0	153.1	44.5
New Brunswick	9 (7)	NA	NA	NA	NA
Quebec	111 (62)	8,120	185.2	2,292.6	602.6
Ontario	149 (62)	8,287	185.5	1,833.2	433.0
Manitoba	27 (7)	940	20.8	190.5	51.6
Saskatchewan	14 (3)	NA	NA	NA	NA
Alberta	30 (6)	NA	NA	NA	NA
British Columbia	25 (8)	2,466	74.5	432.3	111.3
Canada	400	25,354	592.9	5,614.9	1,453.6

Source: Statistics Canada, Cat. No. 32-209, Dairy Products Industries.
NA: Not Available.
1. Includes paid employees and owner-workers, involved in production, sales and administration.

Figures in parentheses indicate number of firms operating in each province.

production, with concentration in the two central provinces of Ontario and Quebec. Ontario has the greatest number of plants, the largest labour force and the highest total employee remuneration, but Quebec has the highest value of shipments of goods produced within the plants and the largest value added across all production, sales and adminstrative activities. The next most important provinces for dairy processing activity, in order, are Alberta, British Columbia and Manitoba (Table 4).

Concentration of ownership on a national basis in the Canadian dairy processing sector in quite low, with the five principal firms accounting for just over two billion dollars of the 5.6 billion dollars of own manufactured goods shipments values, or about 37 percent of the total (Table 5). About half of all 400 plants are operated by 33 different producer cooperatives, providing some indication of the strong links between the milk production and processing sectors. Three of these cooperatives are included in the largest five processing firms, namely Agropur Coopérative agro-alimentaire and Coopérative Agricole du Bas St. Laurent (controlling Purdel) both in Québec province, and Fraser Valley Milk Producers Association in British Columbia (see Table 5). The degree of concentration of ownership ranges from being extremely high in British Columbia, and in the prairie and Atlantic provinces (3 to 8 firms each) to very low in the central provinces (see Table 4, column 1, figures in parentheses).

Approximately 36 percent of total milk and cream shipments are absorbed by fluid processing plants to service consumer needs for fresh milk (standard, partly-skimmed 2 percent chocolate milk, skimmed and buttermilk) and fresh creams (whipping, sour, cereal and table cream). The 2.5 percent, of total shipments that is delivered as farm-separated cream is used exclusively for butter manufacturing, and the remaining 62.5 percent shipped as industrial milk is transformed into butter, skim milk powder, cheeses, condensed and evaporated milks, ice

TABLE 5: Concentration of Ownership in the Canadian Dairy Processing Sector, 1983

Name of Firm	Province(s) of Operation	1983 Value of Shipments of Own Manufactured Goods (mil $)	Percentage of Total Sector Value of Shipments of Own Manufactured Goods (%)
Ault Foods (controlled by Labatt's, London, Ontario)	Ontario	750	13
Agropur Coopérative agro-alimentaire	Quebec	618	11
Fraser Valley Milk Producers Association	British Columbia	327	6
Palm Dairies	Ontario, Saskatchewan, Alberta, British Columbia	200	4
Purdel (controlled by Cooperative Agricole du Bas St. Laurent)	Quebec	189	3
Total, 5 Principal Firms		2,084	37

SOURCE: National Dairy Council, Ottawa

cream, and other products such as whole milk powder, yogurt and cottage cheese (Figure 1).

Retail Sector and Final Demand

There are approximately 33,000 retail food outlets that offer milk and dairy products for sale, while there are some 38,000 restaurants nation wide that include milk and dairy products in their menus.

Canadian consumers spend over 7.25 billion dollars on the purchase of milk and dairy products; this constituted about 18 percent of total food expenditures and nearly two percent of all consumer expenditures. Over 40 percent of the dairy expenditures total is spent on fresh milk and cream products, with the products somewhat lower in butterfat content (partly-skimmed milk and cereal cream, respectively) proving to be the most popular (Table 6). Cheeses are the next most important sub-category of dairy products, accounting for almost 40 percent of total dairy expenditures. Other dairy products with substantial levels of consumer expenditures in Canada include butter and ice cream.

Considerable efforts are put into advertising and promotional campaigns at all levels of the Canadian dairy industry with the objective of expanding domestic demand and revenues. Through a rightward shift in demand curve, these campaigns are instrumental in moving the industry equilibrium up the aggregate supply curve. For an industry operating under open market forces (Figure 2a), this raises unit prices (P1 to P2) and increases quantity sold (Q1 to Q2). For a supply-managed industry (Figure 2b), quantity sold can be maintained at the same level and unit prices raised (P1 to P3), or additional quota can be issued, quantities sold increased (Q1 to Q2) and unit prices raised more modestly (P1 to P2). Producer-financed advertising expenditures

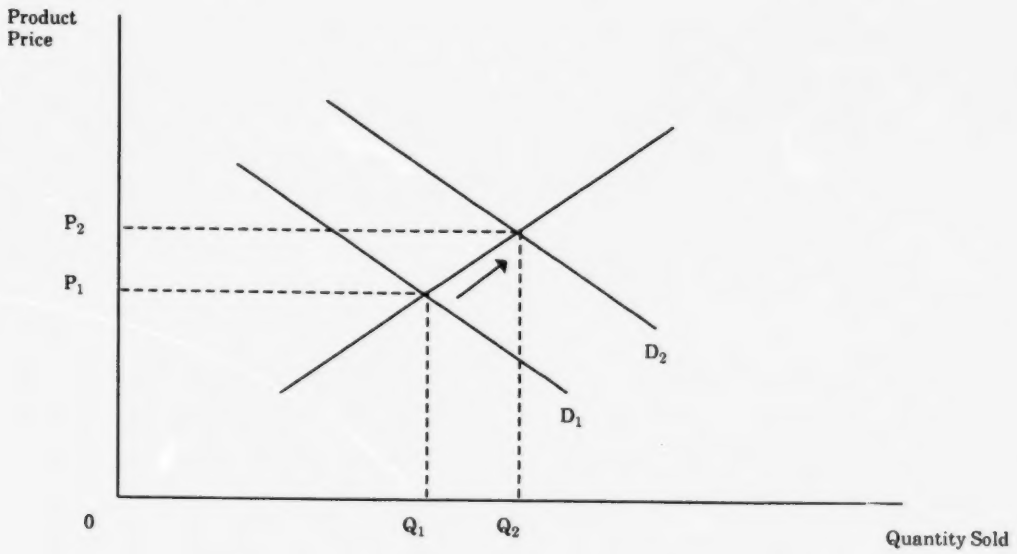
TABLE 6: Per-Capita and Aggregate Disappearance of Milk and Dairy Products, 1985, and Aggregate Consumer Expenditures on Milk and Dairy Products, Canada, 1984

	Per-Capita Disappearance[1]	Aggregate Disappearance	Aggregate Expenditures[2]
	(l)	(kl)	(mil $)
Fresh Milk			
Standard (3.3% B.F.)	32.33	818,067	864.4
Partly-Skimmed (2.05% B.F.)	61.65	1,559,715	1,596.4
Skim Milk (0.05% B.F.)	4.36	110,272	111.8
Chocolate Drink (2.05% B.F.)	3.41	86,062	107.6
Buttermilk (2.05% B.F.)	0.53	13,498	11.5
Total Fresh Milk (actual sales)	98.32	2,487,614	2,691.7
Total Fresh Milk (milk equivalent)	68.96	1,744,752	
Fresh Cream			
Whipping (32% B.F.)	0.84	21,294	
Sour (18% B.F.)	0.72	18,159	
Cereal (10% B.F.)	2.83	71,563	
Table (18% B.F.)	0.33	8,341	
Total Fresh Cream (actual sales)	4.72	119,357	453.4
Total Fresh Cream (milk equivalent)	21.16	535,420	
Ice Cream	12.26	310,207	411.3
Yogurt	2.42	61,243	257.9
	(kg)	('000 kg)	
Butter	4.03	101,955	571.6
Cottage Cheese	1.35	34,092	132.4
Cheddar Cheese[3]	4.03	101,839	1,043.8
Specialty Cheeses[4]	4.74	119,946	1,589.3
Total Cheeses	10.12	255,877	2,765.5
Skim Milk Powder	1.83	46,284	34.9
Evaporated Whole Milk	2.57	64,899	104.6
Evaporated Partly-Skimmed Milk	0.36	9,101	
Condensed Whole Milk	0.56	14,223	
Total, All Dairy Products			7,290.9

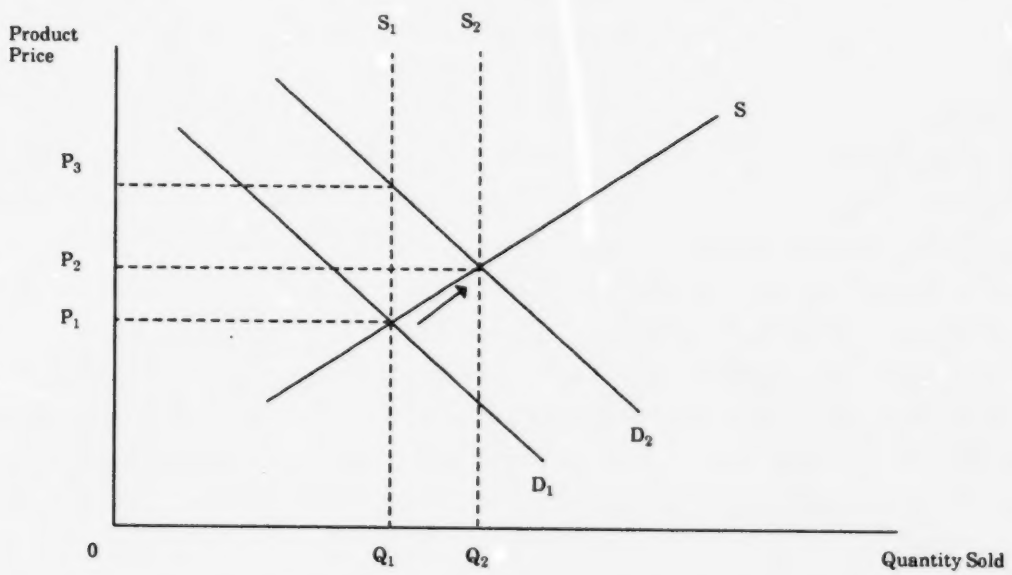
1 SOURCE: Agriculture Canada, Dairy Market Report.
2 SOURCE: Derived from Statistics Canada, Cat. No. 62-554, Family Food Expenditures in Canada, 1984 (average weekly expenditures per family), and Agriculture Canada, Retail Price Survey.
3 Includes Cheddar used in processed cheese.
4 Includes grated and processed cheeses.

FIGURE 2. EXPECTED EFFECTS OF ADVERTISING AND PROMOTION

a) Industries Operating Under Open Market Forces



b) Industries Operating Under Supply Management



amount to some 43 million dollars, with well over half of this amount being spent by the Dairy Bureau of Canada, the umbrella organization responsible for national advertising campaigns. In addition, processors spend over 30 million dollars on a combination of generic and brand advertising.

International Trade Sector

Canada's international trade in merchandise related to the dairy sector amounts to less than half a billion dollars, with Canada enjoying a small surplus of approximately 126 million dollars (Table 7). Compared with the overall level of economic activity in the milk production and processing sectors, (see Tables 1 and 4, respectively), the dollar value of international trade is relatively small, and reflects the Canadian government's policy of basic self-sufficiency in butterfat.

The most important goods exported by Canada are dairy livestock and semen, Cheddar cheese and powdered and concentrated dairy products. Exports of livestock and semen are valued at over 64 million dollars, with most livestock classified as purebred (Table 7, column 1). The principal recipient countries are the United States, South Korea, Mexico and the European Community. Exports of dairy products exceed 200 million dollars, and most take the form of evaporated or powdered milk products, with Cheddar cheese the third in importance. The most important destinations for dairy product exports are Mexico, Peru, Nigeria, Algeria and the Middle East (evaporated and powdered products) and the United States and the United Kingdom (for cheeses).

By far the single most important commodity imported into Canada is specialty cheese, with well over 200 different varieties being selected primarily from western European countries.

TABLE 7: International Trade in Dairy Sector Products, Canada, 1985

	Exports[1]	Imports[2]	Trade Balance
		('000 dollars)	
Dairy Livestock - Purebred	36,305	825	35,480
- Other	15,660	-	15,660
Semen	12,176	-	12,176
Total Livestock & Semen	64,141	825	63,316
Milking Machinery & Parts	201	11,460	(11,259)
Farm Dairy Machinery & Parts	4,259	7,846	(3,587)
Farm Milk Coolers	-	2,661	(2,661)
Farm Cream Separators & Parts	-	171	(171)
Dairy Pasteurizers & Parts	-	1,750	(1,750)
Dairy Plant Machinery	-	26,219	(26,219)
Total Machinery & Equipment	4,460	50,107	(45,647)
Butter	1,247	204[3]	1,043
Cheddar Cheese	28,069	-	28,069
Specialty Cheeses	6,273	91,004	(84,731)
Milk, Cream and By-Products Powdered	82,635	6,062	76,573
Condensed and Evaporated Milk, Cream & By-Products	94,416	629	93,787
Other Dairy Products	4,583	6,269	(1,686)
Casein	102	4,565	(4,463)
Total Dairy Products	217,325	108,733	108,592
Total All Dairy Trade	285,926	159,665	126,261

1 SOURCE: Statistics Canada, Cat. No. 65-202, Exports Merchandise Trade.
2 SOURCE: Statistics Canada, Cat. No. 65-203, Imports Merchandise Trade.
3 Exclusively for re-victualing foreign-owned ships and aircraft at Canadian ports of call.

Specialty cheese imports comprise 91 million dollars of a total dairy sector imports bill of nearly 160 million dollars (57 percent). The number of different varieties and their volumes and values might well have been higher but for a 20.4 million kg annual quota maintained by the federal government. The main sources of cheese imports are the European Community, Switzerland, the United States and New Zealand. Most of the remaining imports are taken up by machinery and equipment for milk production, storage and processing. This category's imports value amounts to over 50 million dollars (Table 7, column 2), with most being imported from the United States and the European Community.

RECENT TRENDS IN THE DAIRY INDUSTRY

Although extensive governmental intervention in the Canadian dairy industry has existed since the end of World War II, it was not until the mid-1960's when major changes in institutional arrangements were introduced at both the federal and provincial levels (Stonehouse, 1979). In particular, the Canadian Dairy Commission (CDC) was inaugurated through federal legislation in 1966 and the following year initiated quotas and in-quota levies for industrial milk and cream. These "subsidy eligibility quotas" were gradually supplanted by "market sharing quotas" with the phasing in of national supply management during the period 1970 to 1974. Under the national supply management plan, aggregate market sharing quota levels for industrial milk are determined by the Canadian Milk Supply Management Committee, which is chaired by the CDC.

The CDC also took over responsibility for direct subsidy payments to producers and offers-to-purchase surplus industrial milk products in 1967, although the subsidy scheme had been introduced in 1962, and the offer-to-purchase scheme in 1946. At the provincial level, a milk marketing board was inaugurated in

1965 in Ontario, one of the two principal dairy provinces, along with shipment quotas and discriminating pricing powers for milk destined for different end uses.

Thus the mid-1960's marked the beginning of a new era of greater governmental intervention and stronger institutions with the potential for modifying the structure of, resource usage and allocation in, and revenues earned by the milk production sector of the dairy industry. The milk processing sector, the retail/consumer sector and international trade sector were also directly affected by the new institutional arrangements. In this section of the paper, trends are examined from 1965 through 1985 in the structure, economic importance and productivity of both the milk production and processing sectors of the Canadian dairy industry. Trends in domestic disappearance and Canada's international trade in dairy products are also reviewed.

Milk Production Sector Trends

Overall shipments of milk and cream have been trending upwards since 1965, albeit with many year-to-year fluctuations (Table 8). This positive trend has paralleled increased market size due strictly to population increases. On a per-capita basis, total sales of milk and cream have declined from 354 litres per annum in 1965 to 289 litres in 1985 (Table 8, column 2). This drop of 65 litres in annual per-capita sales represented a significant decrease of over 18 percent.

Examination of milk and cream shipments in more detail reveals that whilst shipments for fluid purposes enjoyed an overall positive trend, the opposite was true for shipments for industrial purposes. With fluid milk shipments rising on both an aggregate and a per-capita basis, it is apparent that fluid milk and cream products are benefitting from increased demand, which is only partly due to a larger population (Table 8, column 5 & 6).

In fact, per-capita sales rose over six percent from 98 litres in 1965 to 104 litres in 1985, with peak sales of 107 litres recorded in 1979, 1981 and 1982.

In contrast, milk and cream sold for industrial purposes has fallen in both aggregate and per-capita terms. On an aggregate basis, industrial shipments declined 284 million litres, or some 5.7 percent, between 1965 and 1985 (Table 8, column 3), even though the vast majority of these milk and cream shipments were used to service the needs of a domestic population which increased almost 25 percent over the same period. This implies that industrial shipments on a per-capita basis have been suffering a steep decline, estimated to have been equivalent to 70 litres, or over 27 percent, of the 1965 shipments level of 255 litres (Table 8, column 4). The nature and underlying reasons for this decline in domestic disappearance[2] of industrial milk products as a group will be analyzed in more detail below in the section on "Domestic Disappearance Trends".

The positive trend in overall shipments of milk and cream has been accompanied by major structural adjustments in the Canadian dairy industry between 1965 and 1985. Within the milk production sector, the trend has been toward fewer dairy farms and fewer dairy cows, but with an increasing average size of dairy herd on individual farms. Numbers of farms reported to have been shipping milk or cream dropped from almost one-quarter of a million in 1965 to about 44,600 in 1985. The actual reduction in

[2] In this paper, the term "domestic disappearance" is used rather than "domestic demand" because official statistics refer to apparent disappearance (the difference between production plus imports plus opening inventories and exports plus closing inventories).

TABLE 8: AGGREGATE AND PER-CAPITA FARM SALES OF MILK AND CREAM[1], CANADA 1965-85

Year	Total Milk and Cream Sales[1]		Milk and Cream[1] Sold for Industrial Purposes		Milk Sold for Fluid Purposes	
	Canada	Per Capita	Canada	Per Capita	Canada	Per Capita
	('000 kl)	(l)	('000 kl)	(l)	('000 kl)	(l)
1965	6,945	354	5,014	255	1,934	98
1966	7,006	350	5,047	253	1,959	98
1967	6,951	341	5,010	246	1,941	95
1968	7,029	339	5,108	247	1,913	92
1969	7,191	342	5,291	252	1,901	90
1970	7,031	330	5,079	239	1,952	92
1971	6,808	316	4,831	224	1,922	92
1972	6,907	317	4,876	224	2,031	93
1973	6,562	298	4,479	203	2,083	95
1974	6,556	293	4,437	198	2,120	95
1975	7,036	310	4,759	210	2,277	100
1976	6,828	297	4,497	196	2,331	101
1977	6,976	300	4,594	197	2,382	102
1978	6,864	292	4,402	187	2,461	105
1979	6,891	279	4,356	184	2,535	107
1980	7,179	299	4,596	191	2,583	102
1981	7,318	301	4,710	194	2,609	107
1982	7,567	308	4,969	202	2,598	107
1983	7,229	291	4,633	186	2,596	104
1984	7,567	297	4,868	194	2,599	103
1985	7,268	289	4,730	185	2,538	104

SOURCE: Statistics Canada, Cat. No. 23-001, Dairy Review

1/ Cream sales expressed in milk equivalent terms.

registered dairy farm numbers amounted to 203,850, or over 82 percent of the original 1965 total (as shown in Table 9, column 1). The trends in dairy farm numbers by province indicate that structural adjustment in the prairie provinces and in the Maritimes between dairy years 1967-68 and 1984-85 was considerably greater than in Quebec, Ontario and British Columbia (Table 10).

The national dairy herd exceeded 3.5 million head in 1965, but shrank over the next 20 years to some 2.4 million head, a decline of more than 1.1 million head or nearly 33 percent (Table 9, column 4). This shrinkage occurred entirely within the adult cow population, which fell by almost 1.2 million head (Table 9, column 2), while the heifer population increased marginally (Table 9, column 3). The explanation for this divergence between cow and heifer trends can only be conjectured upon. One possible reason is that more heifers are being retained to provide a larger pool of genetic material from which to select herd replacements with "superior characteristics" on each individual farm as levels of inter-farm competition intensify over time. The superior characteristics sought may include calving ease, milk production capacity, speed of milking, handling ease, longevity, etc. Other possible reasons for the cow-heifer divergence are a trend toward a younger culling age, increasing exports of live cattle at a younger age, or larger contributions from the dairy heifer population to beef output.[3]

[3] One other contributing factor may have been the change in definition of a dairy heifer from "an animal two years and over raised mainly for milk purposes" (1975) to "an animal which has calved, raised mainly for milk purposes" (1976).

TABLE 9: CHANGES IN STRUCTURE OF THE MILK PRODUCTION SECTOR OF THE CANADIAN DAIRY INDUSTRY, 1965-85

Year	Number of Dairy Farms Shipping Milk or Cream to Processing Plants[1]	Number of Dairy Cows on Farms[2]	Number of Heifers being Raised for Milking Purposes[2]	Total Cows and Heifers on Farm[2]	Average Herd Size	
					Dairy Cows Only	Cows and Heifers
		('000 head)	('000 head)	('000 head)		
1965	248,479	2,885.0	665.8	3,550.8	11.6	14.3
1966	221,850	2,673.9	615.5	3,289.4	12.1	14.8
1967	197,642	2,569.0	594.2	3,163.2	13.0	16.0
1968	174,139	2,489.0	598.2	3,087.2	14.3	17.8
1969	153,022	2,442.0	597.0	3,039.0	16.0	19.9
1970	136,828	2,389.0	572.4	2,961.4	17.5	21.6
1971	122,914	2,255.1	560.6	2,815.7	18.4	22.9
1972	113,008	2,206.0	497.8	2,703.8	19.5	23.9
1973	105,468	2,141.0	507.3	2,648.3	20.3	25.1
1974	95,312	2,071.0	531.6	2,602.6	21.7	27.3
1975	84,261	2,044.0	538.3[3]	2,582.3	24.3	30.7
1976	79,833	2,001.6	711.3	2,712.9	25.1	34.0
1977	72,495	1,953.6	689.2	2,642.8	27.0	36.5
1978	66,766	1,862.5	683.0	2,545.5	27.9	38.1
1979	62,590	1,790.2	691.8	2,482.0	28.6	39.7
1980	56,370	1,764.5	719.3	2,483.8	31.3	44.1
1981	55,733	1,779.9	748.3	2,527.3	31.9	45.4
1982	52,567	1,789.9	741.3	2,531.2	34.1	48.2
1983	49,936	1,732.2	710.1	2,442.3	34.7	48.9
1984	46,859	1,727.9	704.7	2,432.6	36.9	51.9
1985	44,629	1,695.5	693.8	2,389.3	38.0	53.5

1 SOURCES: Canadian Dairy Commission; Statistics Canada, Census of Canada

2 SOURCES: Statistics Canada, Cat. No. 23-004, Report on Livestock Surveys
Statistics Canada, Cat. No. 23-203, Livestock and Animal Product Statistics

3 Definition changed from "an animal two years and over raised mainly for milk purposes" to "an animal which has calved, raised mainly for milk purposes".

TABLE 10: TRENDS IN NUMBERS OF DAIRY FARMS, BY PROVINCE, FOR SELECTED DAIRY YEARS, 1967-68 TO 1984-85

	Dairy Year					
	1967-68[1]	1972-73[1]	1977-78[1]	1982-83[2]	1984-85[2]	% change 1967-68 to 1984-85
Prince Edward Island	3,776	2,155	1,274	950	876	-76.8
Nova Scotia	3,756	1,479	1,059	906	836	-77.7
New Brunswick	3,717	1,726	1,080	864	770	-79.3
Quebec	58,994	36,007	24,984	19,850	18,594	-68.5
Ontario	40,420	25,197	17,505	14,100	13,135	-67.5
Manitoba	15,512	9,603	5,234	3,770	3,054	-80.3
Saskatchewan	21,493	13,632	6,615	3,677	2,805	-86.9
Alberta	23,769	14,177	7,653	4,655	3,470	-85.4
British Columbia	2,702	1,492	1,362	1,164	1,089	-59.7
Canada	174,139	105,468	66,766	49,936	44,629	-74.4

SOURCE: Canadian Dairy Commission

1 Dairy year defined as April 1 to March 31.

2 Dairy year defined as August 1 to July 31.

Individual farm's herd size has increased substantially, given that dairy farm numbers have declined at a much greater rate than dairy cattle numbers. Measured in terms of adult cows only, the average herd size has grown from 11.6 in 1965 to 38.0 in 1985, an increase of almost 228 percent (Table 9, column 5). With the inclusion of heifers, the herd size has expanded from an average of 14.3 animals in 1965 to 53.5 head in 1985, an increase of 274 percent (Table 9, column 6).

Despite the smaller size of the milk production sector, as measured by numbers of dairy farms and by the aggregate dairy herd size, its importance in economic terms had diminished very little in the period 1965 to 1985. While total farm cash receipts from dairying from all sources grew from 671 million dollars in 1965 to almost 3.5 billion dollars in 1985, an increase of 420 percent (Table 11, column 4), total farm cash receipts from all sources rose from 3.8 billion dollars in 1965 to just over 20 billion dollars in 1985, an increase of 427 percent (Table 11, column 5). Expressed in percentage terms, dairying contributed 18 percent to total farm cash receipts in Canada in 1965, and its share fell by only one percentage point over the ensuing 20 years (Table 11, column 6). Milk production's share of overall economic activity for the country also declined over the same period, but by a much more substantial amount, dropping from 1.17 percent in 1965 to 0.73 percent in 1985 (Table 11, column 7). This reflects the declining importance of economic activity in the agricultural sector as a whole, relative to most other sectors of the economy.

Productivity in the Canadian dairy industry has improved steadily over the period 1965 to 1985, illustrated by two examples each of technical and economic productivity measures. Technical productivity, or the amount of output of a commodity per unit of resource input, is measured here by average milk shipments per man

TABLE 11: ECONOMIC IMPORTANCE OF THE MILK PRODUCTION SECTOR OF THE DAIRY INDUSTRY

Year	Farm Cash Receipts from Dairying[1]				Total Farm Cash Receipts[1]	Dairy Cash Receipts as % of Total Farm Cash Receipts	Dairy Cash Receipts as % of Gross Domestic Product
	Milk Sales	Livestock Sales	Govt. Subsidies	Total			
	(million dollars)				(million $)	(%)	(%)
1965	559	95	17	671	3,802	18	1.17
1966	584	110	69	763	4,294	18	1.19
1967	624	112	103	839	4,382	19	1.21
1968	644	124	110	878	4,363	20	1.16
1969	677	121	87	885	4,206	21	1.07
1970	677	123	67	867	4,197	21	0.97
1971	705	135	100	940	4,513	21	0.97
1972	779	150	101	1,030	5,451	19	0.95
1973	841	197	131	1,169	6,840	17	0.92
1974	1,088	210	221	1,519	8,879	17	0.99
1975	1,349	222	260	1,831	9,907	19	1.07
1976	1,319	246	262	1,827	9,975	18	0.92
1977	1,419	257	271	1,947	10,138	19	0.89
1978	1,514	370	243	2,127	11,887	18	0.88
1979	1,689	435	255	2,379	14,077	17	0.86
1980	2,061	450	255	2,766	15,639	18	0.89
1981	2,373	443	281	3,097	18,544	17	0.87
1982	2,640	434	274	3,348	19,044	18	0.89
1983	2,464	411	266	3,141	18,659	17	0.77
1984	2,707	422	281	3,410	20,232	17	0.77
1985	2,778	428	282	3,488	20,040	17	0.73

1 SOURCE: Statistics Canada, Cat. No. 21-001, Farm Cash Receipts.

equivalent and by average milk shipments per cow.[4] To measure average milk shipments per man equivalent, it was necessary to define a man equivalent. A man equivalent is defined as one person working full-time, year round for 3,000 hours on all aspects of dairying, including care and maintenance of replacement as well as adult livestock, production and storage of feeds to support dairy livestock, care and maintenance of machinery and equipment for dairy feed crop production, milk production and manure-handling, and management. The number of man equivalents was estimated to be 1.5, by extrapolation from Ontario Farm Management Analysis Project data. Labour inputs per dairy enterprise over the period 1965 to 1985 have remained relatively constant, with increases in average herd size leading to higher labour requirements being offset by the lower labour requirements made possible by increased mechanization through capital-labour substitution and the adoption of more sophisticated feed production, milking and manure-handling technology. Average shipments per man equivalent have risen from 18,633 litres in 1965 to 108,569 litres in 1984, an increase of 89,936 litres (Table 12, column 2), or 483 percent. The annual average growth in shipments per man equivalent of over seven percent is reflective of the substantial structural changes that have taken place in Canada's dairy industry.

The growth in average milk shipments per cow over this same period, while not so impressive in terms of amount, is nevertheless indicative of the strong productivity gains made in the milk production sector. From an average of 2,407 litres per cow in 1965, shipments have increased by 1,800 litres (78 percent) to 4,287 litres in 1985, (Table 12, column 2). These gains can be attributed to an upgrading of the genetic potential of the

[4] Paucity of data prevented the use of other measures of productivity that may be deemed more appropriate.

TABLE 12: PRODUCTIVITY TRENDS IN THE MILK PRODUCTION OF THE CANADIAN DAIRY INDUSTRY, 1965-85

	Average Milk Shipments per Dairy Farm Shipping to Dairy Processing Plants	Average Milk Shipments Per Main Equivalent[1]	Average Milk Shipments per Cow	Average Farm Cash Receipts from Dairying per Cow	Average Farm Cash Receipts from Dairying per Man Equivalent[1]
	(litres)	(litres)	(litres)	(real 1981$)[2]	(real 1981 $)[2]
1965	27,950	18,633	2,407	802	6,208
1966	31,580	21,053	2,620	951	7,643
1967	35,170	23,447	2,706	1,054	9,129
1968	40,364	26,909	2,824	1,102	10,504
1969	46,993	31,329	2,945	1,098	11,684
1970	51,386	34,257	2,943	1,067	12,424
1971	55,388	36,925	3,019	1,191	14,567
1972	61,120	40,747	3,131	1,262	16,422
1973	62,218	41,479	3,065	1,213	16,421
1974	68,785	45,857	3,166	1,384	20,047
1975	83,502	55,668	3,442	1,572	25,417
1976	85,529	57,019	3,411	1,521	25,428
1977	96,227	64,151	3,571	1,582	28,420
1978	102,807	68,538	3,685	1,631	30,341
1979	110,097	73,398	3,849	1,621	30,902
1980	127,355	84,903	4,069	1,761	36,756
1981	131,305	87,537	4,114	1,741	37,045
1982	143,950	95,967	4,228	1,818	41,263
1983	144,765	96,510	4,173	1,737	40,166
1984	159,350	106,233	4,321	1,843	45,298
1985	162,854	108,569	4,287	1,913	48,443

1. An average of 1.5 man equivalents per dairy enterprise is used, based on OFMAP data.
2. Deflated by Farm Input Price Index.

Canadian dairy herd obtained through superior selection and breeding techniques, including artificial insemination, and also to greater realization of that genetic potential through improvements made in feed quality and nutrition, in disease control, and in a wide range of other management areas.

Economic productivity, or the value of commodity output per unit of resource input, is measured here by average farm cash receipts from dairying per cow and per man equivalent employed in the dairy enterprise.[5] Because much of the change in value measures of productivity over time can be attributed to changes in value of currency, economic productivity is best measured in constant or deflated dollar terms. The farm input price index was used as a deflator in this paper. From 802 dollars per cow in 1965, farm cash receipts grew to 1,913 dollars per cow by 1985, (Table 12, column 3), an increase of 1,111 dollars or 138.5 percent. Economic productivity per man equivalent is estimated to have risen (in real 1981 dollars) from 6,208 dollars in 1965 to 48,443 dollars in 1985 (Table 12, column 4), an increase of 42,235 dollars, or 680 percent.

Trends in Milk Processing Sector

Analogously to the trends in the milk production sector, the milk processing sector has become a smaller, leaner and more productive component of Canada's dairy industry. From a sector composed of 1,413 processing plants in 1965, there remained an estimated 390 plants in 1985 (Table 13, column 1). This represented a net decrease of 1,023 plants, or 72 percent of the 1965 total. Accompanying this widespread closure of plants has

[5] As for technical productivity measures, these measures of economic productivity were used because data were available for cash receipts, but not for profits or net returns, on a national basis.

TABLE 13: Economic Importance of the Processing Sector of the Canadian Dairy Industry

Year	Number of Dairy Processing Plants[1,4]	Total Number in Labour Force in Processing[2,4]	Total Activity Value Added in Processing Sector[3,4]	Canadian Gross Domestic Product[5]	Processing Sector Value Added as % of Canadian GDP
			($'000)	(Billion $)	
1965	1,413	32,340	270,967	57,523	0.47
1966	1,308	32,280	286,790	64,388	0.45
1967	1,175	31,674	300,546	69,064	0.44
1968	1,037	30,103	316,635	75,418	0.42
1969	958	31,230	378,701	83,026	0.46
1970	880	30,657	389,144	89,116	0.44
1971	809	32,855	428,498	97,290	0.44
1972	731	28,947	439,955	108,629	0.41
1973	646	27,819	467,409	127,372	0.37
1974	556	27,316	545,872	152,111	0.36
1975	519	27,988	631,318	171,540	0.37
1976	491	26,280	700,772	197,924	0.35
1977	466	26,550	787,946	217,879	0.36
1978	485	26,972	890,886	241,604	0.37
1979	472	26,257	999,186	276,096	0.36
1980	456	26,028	1,040,402	309,891	0.34
1981	416	26,196	1,218,176	355,994	0.34
1982	402	25,796	1,328,478	374,750	0.35
1983	400	25,306	1,453,551	405,425	0.36
1984	401	25,368	1,412,119	443,327	0.32
1985	390 p	25,150 p	1,579,612 p	476,361	0.33

1 Includes fluid and industrial milk processing plants.
2 Includes paid employees and owner-workers, involved in production, sales and administration.
3 Includes production, sales and administration activities.
4 SOURCE: Statistics Canada, Cat. No. 32-209, Dairy Products Industry
5 SOURCE: Statistics Canada, Cat. No. 11-003E, Canaian Statistical Review.
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been a diminution of the labour force. Total employment, including plant owner-workers, fell 7,190 (or 22 percent) from 32,340 in 1965 to estimated 25,150 in 1985 (Table 13, column 2). Further examination of Statistics Canada data reveals that it has been generally the smaller processing plants with small numbers of employees that have closed, while new processing plants opening between 1965 and 1985 were larger in terms of numbers in the labour force. This structural adjustment toward fewer, but larger processing plants holds positive expectations for resource productivity improvements, but has resulted in some loss of economic importance of this sector. While activity value added rose from 270 million dollars in 1965 to over 1.5 billion dollars in 1985 on a non-deflated basis, (Table 13, column 3), the percentage contribution to gross domestic product fell from 0.47 percent in 1965 to 0.33 percent in 1985 (Table 13, column 5). Gross domestic product figures are also stipulated in non-deflated dollars for true comparison purposes (Table 13, column 4).

Nevertheless there were substantial gains in productivity recorded by the dairy processing sector between 1965 and 1985. With total milk shipments from producers increasing (Table 8) and numbers of processing plants declining (Table 13), the average volumn of milk processed per plant necessarily increased over the period. In fact the increase from 4,915 kl per plant in 1965 to 18,636 kl in 1985 was 13,721 kl, or 279 percent (Table 14, column 1). Similarly, volume of milk processed per plant employee increased, but only by an estimated 74 kl or 34 percent (Table 14, column 2). Value added per processing plant employee also increased at a moderate rate in real (inflation-adjusted 1985 dollar) terms, having risen from 31,032 dollars in 1965 to 48,688 dollars in 1985. This represented growth of 17,656 dollars per employee, or about 57 percent (Table 14, column 3). These productivity gains can be attributed to capital-labour substitution as more sophisticated plant technology is employed, to economies of size and scale as larger-sized

TABLE 14: Productivity Trends in the Processing Sector of the Dairy Industry, 1965-1985

Year	Volume of Milk Processed per Plant	Volume of Milk Processed per Processing Plant Employee	Value Added per Processing Plant Employee
	(kl)	(kl)	(real 1981$)
1965	4,915	215.0	31,032
1966	5,356	217.2	30,636
1967	5,916	291.5	30,609
1968	6,778	233.5	32,870
1969	7,506	230.3	37,894
1970	7,990	229.3	39,667
1971	8,415	207.2	37,263
1972	9,449	238.6	41,077
1973	10,158	235.9	42,004
1974	11,791	240.0	42,518
1975	13,557	251.4	38,232
1976	13,906	259.8	43,009
1977	14,970	262.8	44,966
1978	14,153	254.5	46,521
1979	14,600	262.4	48,787
1980	15,743	275.8	45,423
1981	17,591	279.4	46,502
1982	18,823	291.3	46,690
1983	18,073	285.7	49,389
1984	18,621	294.4	44,891
1985	18,636 p	289.0 p	48,688 p

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equipment becomes more feasible through declining plant numbers or as existing equipment becomes more fully utilized, and to a better trained and skilled labour force as reduced seasonal variations in milk shipments permits the retention of a larger proportion of full-time, permanent employees.

Trends in Domestic Disappearance of Dairy Products

Domestic disappearance of milk and dairy products in the period 1965 to 1985 was characterized by a positive trend for the fluid (milk and creams) market and by a negative trend for the industrial (butter, cheeses and other manufactured products) market, whether this is measured in aggregate or per-capita terms, as previously discussed with reference to Table 8. However, within each of the two principal milk markets there occurred some wide divergences in trends in per-capita domestic disappearance of individual dairy products, divergences which have had, and continue to have, some interesting implications and consequences for the Canadian dairy industry.

For milk and cream products as a group, domestic disappearance per capita has been rising (Table 15, column 1). Within the fluid milk subgroup, growing consumer awareness of the importance of good nutrition and increasing concerns about levels of saturated fats in the diet have encouraged per-capita disappearance of "low-fat" milks (partly-skimmed, skimmed, chocolate and buttermilk) at the expense of "standard" milk disappearance. This trend has been enhanced by retail pricing factors in many major urban centres of Canada, namely a unit price differential that favours partly-skimmed over standard milk. Such price differentials were gradually introduced during the 1970's and by the mid-1980's, were quite commonplace. The switch from standard to low-fat milk, together with a rising average butterfat

TABLE 15: Trends in Per-Capita Domestic Disappearance of Selected Dairy Products, Canada, 1965-1985

Year	Fluid Milks and Creams	Ice Cream	Yogurt	Cottage Cheese	Cheddar Cheese	Specialty Cheeses	Butter	Evaporated Whole Milk
	(l)	(l)	(l)	(kg)	(kg)	(kg)	(kg)	(kg)
1965	98.4	12.0	NA	0.71	3.28	0.85	8.21	6.91
1966	98.1	12.1	NA	0.72	3.24	0.93	7.87	6.79
1967	95.4	12.5	NA	0.73	3.39	1.06	7.48	6.43
1968	92.3	12.2	0.22	0.75	3.49	1.21	7.28	6.24
1969	90.4	12.6	0.28	0.83	3.71	1.39	6.94	5.76
1970	91.5	12.7	0.38	0.92	3.90	1.48	6.95	5.48
1971	92.3	12.6	0.48	0.99	3.34	1.70	6.90	5.36
1972	93.2	12.7	0.56	1.03	3.44	1.71	6.58	5.08
1973	94.4	12.5	0.62	1.10	3.84	1.81	6.01	4.75
1974	94.6	12.4	0.65	1.03	3.84	2.58	5.86	4.39
1975	101.3	12.6	0.72	1.02	3.66	2.46	5.25	3.99
1976	103.3	12.2	0.89	1.07	3.65	2.69	5.08	3.96
1977	104.1	12.6	1.18	1.11	3.40	2.96	4.59	3.95
1978	105.8	12.3	1.68	1.12	3.64	3.29	4.56	4.33
1979	108.6	13.0	1.69	1.14	3.98	3.49	4.45	2.48
1980	108.8	13.0	1.69	1.25	4.14	3.56	4.52	2.25
1981	108.2	12.9	1.67	1.28	3.94	3.74	4.43	2.11
1982	108.0	12.3	1.73	1.21	3.64	3.96	4.28	2.37
1983	107.4	12.5	1.89	1.22	3.68	3.91	4.41	2.79
1984	107.0	12.0	2.12	1.22	3.80	4.31	4.22	1.32
1985	103.1	12.3	2.42	1.35	4.03	4.74	4.03	2.57

SOURCES: Statistics Canada, Cat. No. 23-001, Dairy Review
Statistics Canada, Cat. No. 23-201, Dairy Statistics
Agriculture Canada, Dairy Market Report

content in all milk shipped in Canada throughout the period 1965 to 1985, has produced increasing volumes of so-called "skim-off" cream. Skim-off cream is derived from the processing of the raw product with an average butterfat content of 3.7 kg per hectolitre (3.6 percent) into the various fluid milk products sold over the retail counter. This skim-off cream is then available for manufacturing industrial products such as ice-cream or butter.

Paradoxically, the same diet-and-health-conscious Canadian public has displayed a trend toward increasing disappearance of table creams of all types, but particularly sour cream, during the period 1965 to 1985. The positive trend applied to both aggregate and per-capita disappearance, and absorbed some, but by no means all, of the skim-off cream pool. Gradually increasing amounts of skim-off cream were being diverted into butter manufacturing, with some important positive consequences for the Canadian milk production sector, as follows. Domestic and commercial export requirements for industrial milk and cream in Canada are expressed on a butterfat basis. A large but declining (from about 70 to 50 percent during 1965 to 1985) portion of total industrial milk and cream is used for manufacturing creamery butter, and where whole milk is the raw material used, there is a by-product in the form of skim milk. The skim milk is usually transformed into skim milk powder, essentially the solids-non-fat portion of whole milk, and a commodity in surplus supply in Canada. The skim milk powder surplus to Canadian domestic requirements must be disposed of in international markets where there are also surpluses and therefore depressed prices. The need for milk producers to subsidize these export sales means that it may not be in their interests to have any more skim milk powder produced that can be readily absorbed by the domestic market. However, skim milk powder is a necessary by-product of the butter manufacturing process, where whole milk is the raw material input. This would no longer pose a problem if domestic and commercial export requirements for industrial milk and cream were based on

the solids-non-fat instead of butterfat content. Another potential solution would be to manufacture butter from cream only instead of from an admixture of skim-off cream, farm-separated cream and industrial whole milk. The increasing volume of skim-off cream available for butter production is helping to realize this potential, and this assists the milk production sector financially.

The per-capita domestic disappearance trends within the industrial sector range from decidedly negative for butter and evaporated milk, through little change for ice-cream, to very positive for cheeses and yogurt. For ice-cream, per-capita disappearance has stayed in the 12-to-13-litres range between 1965 to 1985 (Table 15, column 2), but with a rising population, aggregate domestic disappearance has been increasing. Yogurt has been finding increasing favour with Canadian consumers, rising from a meagre 0.22 litres per capita in 1968 to 2.42 litres in 1985, a ten-fold increase (Table 15, column 3). The popularity of cottage cheese, Cheddar cheese and specialty cheeses has also been rising, with domestic disappearance increasing by 0.64 kg, 0.75 kg and 3.89 kg, respectively, during the period 1965-1985. These represent increases of 90 percent, 23 percent and 458 percent, respectively (Table 15, columns 4, 5 and 6).

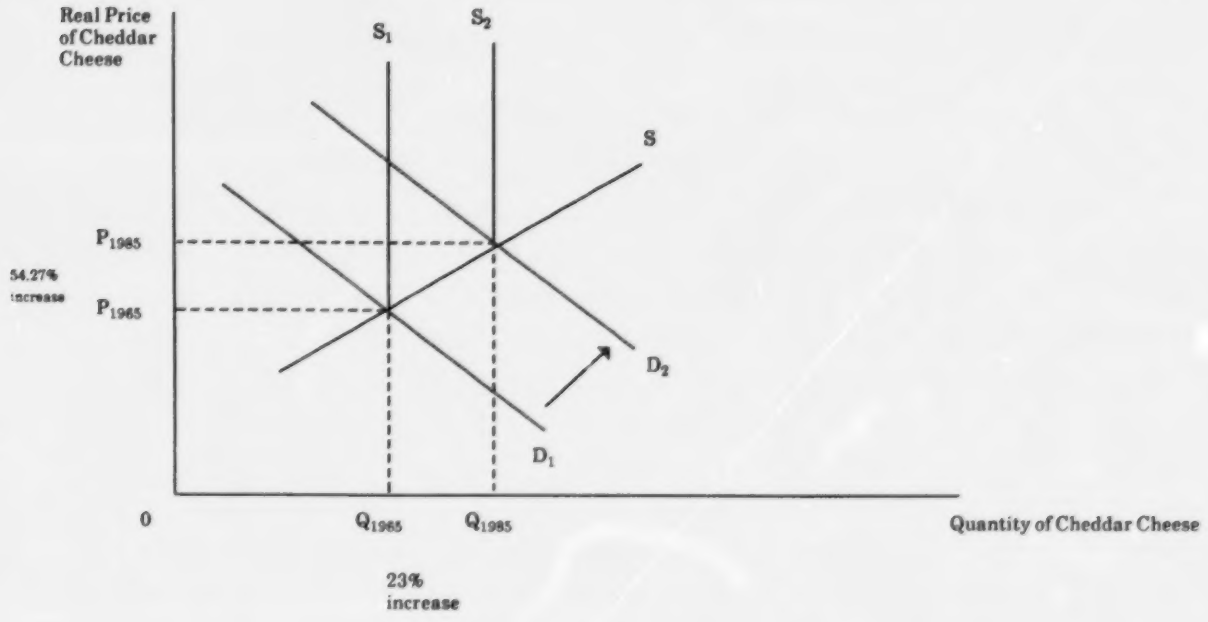
For each of yogurt, cottage cheese, Cheddar and specialty cheeses, these increases in per-capita domestic disappearance are translated into much larger increases in aggregate disappearance due to the rising population factor. For each of these products too, the rising domestic disappearance is indicative of rightward shift in the demand curve. Retail prices in constant dollar terms for Cheddar cheese for example, rose by 54.27 percent between 1965 and 1985 (Figure 3a). With negative own price elasticity of -0.75 (Agriculture Canada, Food Market Analysis Division (FMAD)) price effects alone would have reduced per-capita disappearance. The actual 23-percent increase in

Cheddar cheese disappearance can be partly attributed to the rising affluence of Canadians. The income elasticity for Cheddar cheese is estimated to be 0.317 (Agriculture Canada, FMAD) and per-capita real incomes for Canadians have risen 79.4 percent between 1965 and 1985, so that demand would have risen due to income effects alone. Changing consumer tastes have also contributed to rising demand for yogurt and cheeses, based on the growing perception in the minds of Canadian consumers that these dairy products are nutritionally beneficial, in terms of protein and mineral content. Figure 3a shows that the positive effects on domestic disappearance of rising incomes and changes in tastes have more than compensated for the negative effects of rising prices.

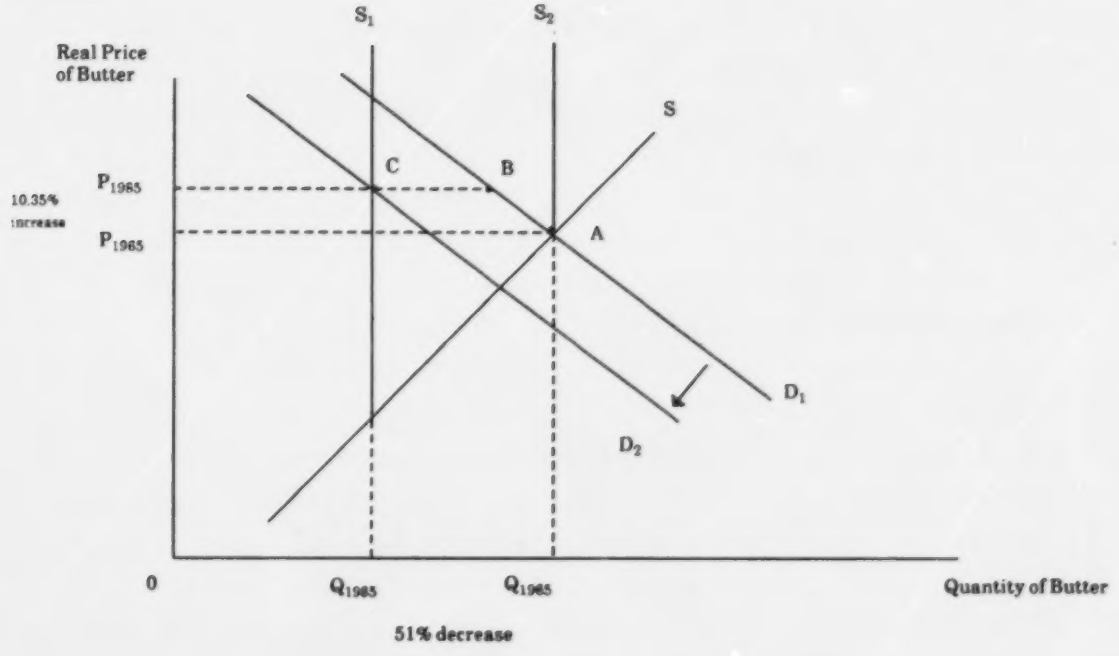
In contrast, the domestic disappearance of other dairy products such as butter, and concentrated and powdered milk products has declined over the period 1965 to 1985. For example, butter disappearance more than halved from 8.21 kg to 4.03 kg per capita over this 20-year period (Table 15, column 7), while evaporated whole milk disappearance dropped 4.34 kg (63 percent) from 6.91 kg to 2.57 kg per capita (Table 15, column 8). Using butter as an example, the unit retail price, expressed in constant dollar terms, rose by 10.35 percent between 1965 to 1985. This would have reduced quantity of butter demanded by 6.6 percent, (represented by a movement from point A to point B along demand curve D1 in Figure 3b) given an own price elasticity coefficient of -0.49 (Agriculture Canada, FMAD, 1986). The reduction in domestic disappearance of butter of 4.18 kg (51 percent) over this period signifies that butter's competitive position was deteriorating, due to the decreasing relative prices of margarines and cooking fats and oils which compete with butter. Another factor was butter's declining popularity as Canadians were persuaded to reduce the level of fats in their diet, and particularly the level of saturated animal fats, on medical grounds. Butter also has a negative income elasticity coefficient

FIGURE 3. CHANGES IN CANADIAN DOMESTIC DISAPPEARANCE OF MAJOR DAIRY PRODUCTS, 1965-1985

a) Cheddar Cheese



b) Butter



(-0.198 according to Agriculture Canada FMAD, 1986). The combined effects of declining competitiveness, decreasing popularity, and negative income elasticity were to shift demand for butter to the left. This is represented by a shift of demand to point C on curve D2 in figure 3b.

Declining domestic disappearance of evaporated milk may be a reflection of changing technology, as well as changing consumer tastes. Improved in-home refrigeration has enabled consumers to replace evaporated and sweetened condensed milk in cans with pasteurized fluid milks in bags or cartons.

The net effect of these changes in demand for the various industrial milk products has been to reduce overall domestic disappearance of these products on a milk-equivalent basis. The explanation is that butter disappearance has a disproportinately large influence on aggregate industrial milk disappearance because of the relatively large volume of milk required to produce a kilogram of product (Table 16), and that increases in per-capita disappearance of cheeses and yogurt have not been sufficient to offset the decreases in per-capita disappearance of butter, powdered milk products and concentrated milk products on a milk-equivalent basis. The result is a gradually but steadily shrinking industrial milk sector in Canada, despite a growing population base. A continuation of these past trends could eventually lead to an expanding industrial milk sector when, at some point in the future, the positive effects of growth in cheeses and yogurt more than compensate for the negative effects of decreases in butter and other products.

Trends in International Trade in Dairy Sector Commodities

Although not of great economic importance relative to the size of the domestic dairy industry, Canada's international

TABLE 16: Conversion Rates of Milk to Dairy Products

Product	Butterfat by Weight	Fluid Milk per kg Product
	(%)	(l)
Butter	81.0	22.73
Cheddar/Specialty Cheeses	34.0	10.68
Cream Cheese	32.0	10.01
Cottage Cheese (Creamed)	4.0	1.11
Condensed Milk	8.0	2.23
Evaporated Whole Milk[1]	8.0	2.23
Partly-Skimmed Evaporated Milk	4.0	1.07
Whole Milk Powder	27.0	7.78
Cream Powder	73.5	20.42
Skim Milk Powder	-	10.68

SOURCE: Dairy Farmers of Canada, "Dairy Facts and Figures, 1985"

1 2 percent partly-skimmed evaporated milk has only been produced since 1983.

TABLE 17: Canada's International Trade in Selected Dairy Sector Commodities, 1965-85

Year	Exports[1]		Imports[2]		Net Trade		
	Livestock & Semen	Dairy Products	Livestock	Dairy Products	Live-stock	Dairy Products	Livestock and Dairy Products
	(thousand dollars)						
1965	15,065	47,144	-	12,761	15,065	34,383	49,448
1966	17,401	36,373	-	18,184	17,401	18,189	35,590
1967	13,466	31,239	-	18,773	13,466	12,506	25,972
1968	15,503	30,496	271	17,321	15,232	13,175	28,407
1969	20,937	34,132	543	20,102	20,394	14,030	34,424
1970	30,397	52,039	446	21,374	29,951	30,665	60,616
1971	30,244	66,395	837	24,888	29,387	41,507	70,894
1972	32,244	48,790	1,174	33,812	31,070	14,978	46,048
1973	45,271	87,998	3,086	63,593	42,185	24,405	66,590
1974	25,204	65,957	3,113	82,717	22,091	(16,760)	5,331
1975	17,030	36,668	4,120	58,331	12,910	(21,663)	(8,753)
1976	28,036	63,608	1,224	56,720	26,812	6,888	33,700
1977	18,783	47,047	1,086	53,570	17,697	(6,523)	11,174
1978	40,074	92,515	431	78,434	39,643	14,081	53,724
1979	54,032	121,799	1,559	80,941	52,473	40,858	93,331
1980	49,155	159,532	1,998	89,881	47,157	69,552	116,709
1981	43,830	210,433	2,107	93,961	41,723	116,472	158,195
1982	52,335	285,072	1,754	105,606	50,581	179,466	230,047
1983	65,363	238,808	2,238	101,695	63,125	137,113	200,238
1984	63,772	243,229	1,727	112,891	62,045	130,338	192,383
1985	64,141	217,325	825	108,733	63,316	108,592	171,908

1 SOURCE: Statistics Canada, Cat. No. 65-202, Exports Merchandise Trade.

2 SOURCE: Statistics Canada, Cat. No. 65-203, Imports Merchandise Trade.

trade in the principal commodities of livestock and dairy products has been a positive factor over the period 1965 to 1985. In almost every year there was a net contribution made to the national balance of merchandise trade and to the domestic dairy industry, and this net positive trade balance grew from about 49.5 million dollars in 1965 to nearly 223 million dollars in 1985 (Table 17). This growth of 173.5 million dollars represented a percentage increase of 350 in current dollar terms, or 103 percent in constant dollar terms.

The principal contributors to the net positive balance in dairy merchandise trade have been livestock and semen, and, in all but three years between 1965 and 1985, dairy products (Table 17). Canada is a net exporter in most years of Cheddar cheese, powdered dairy products and condensed dairy products, and a regular net importer of specialty cheeses. Following specialty cheeses, Canada's most important group of dairy sector imports is dairy machinery and equipment (see Table 7 for 1985 figures, for example).

Attention is focussed on the government policies and the institutional mechanisms under which Canada's dairy industry operate in the next section of this paper.

GOVERNMENT POLICIES AND INSTITUTIONAL ARRANGEMENTS FOR THE CANADIAN DAIRY INDUSTRY

The Canadian milk production sector was one of only four industries within agriculture having a supply management system at the national level in 1985; the others were chickens, turkeys and eggs. The dairy industry has had the longest experience with supply management in agriculture in this country, and also has the longest history of supply management in dairying anywhere in the world. The Canadian dairy industry is also

arguably the most heavily and comprehensively regulated dairy industry amongst the major dairy exporting countries.[6]

The plethora of policy instruments and institutional arrangements increases the level of complexity of the industry, and makes it more difficult to understand, to examine, to evaluate and to offer guidance to policy-makers. In this section of the paper, the principal attributes and raison d'être for each policy instrument and institution are outlined as an aid to those interested in understanding or researching into the Canadian dairy industry.

An Overview of the Institutions

One of the reasons for the wide array of institutions and policies associated with the Canadian dairy industry is the political structure of the country. Having a federation of provinces, each with its own measure of autonomy in specific jurisdictional areas, but also specific federal jurisdictional areas, necessitates institutional arrangements at both federal and provincial levels.

The federal government's crown corporation, the Canadian Dairy Commission (CDC), was legislated into existence in 1965 and began operations in 1966 with a mandate to ensure that efficient Canadian milk producers receive a fair and reasonable return to their resource input and that Canadian milk and dairy product consumers are assured of year-round access to adequate supplies of high quality milk and dairy products.

[6] The European Economic Community also has had a heavily regulated dairy industry since the introduction of supply management through quotas in 1984.

Figure 4: A Schematic of Canadian Dairy Industry Institutions

	Milk Production Sector	Milk Processing Sector	Retail Trade	Consumers
a) Federal	Dairy Farmers of Canada Dairy Bureau of Canada Canadian Dairy Commission (Crown Corporation)	National Dairy Council	Retail Council of Canada	Consumers Association of Canada
b) Federal-Provincial	Canadian Milk Supply Management Committee			
c) Provincial	Marketing Boards or Commissions	Provincial Dairy Councils		Provincial Consumer Associations

Milk producers are regulated and supported in part by the CDC at the federal level and in part by a marketing board or commission at the provincial level. These federal and provincial institutions jointly ensure that the Canadian supply management and income support systems operate effectively for all milk producers. In particular, the supply management program is administered by the CDC, but regulated and adjusted by the Canadian Milk Supply Management Committee (CMSMC), a body chaired by the CDC and with representatives from each provincial marketing board. The interests of milk producers are also ably supported through firstly, the lobbying and promotional efforts of the Dairy Farmers of Canada (DFC), headquartered in Ottawa as part of the umbrella organization, Canadian Federation of Agriculture; and secondly, through the advertising and promotional campaigns of the Dairy Bureau of Canada (DBC), which also operates some programs in conjunction with the processing sector of the dairy industry.

Dairy processing companies usually belong both to the provincial dairy council for the province(s) in which they operate and to the National Dairy Council (NDC) with headquarters in Ottawa. The NDC and its provincial counterparts seek to further the interests of all dairy processors through research programs, information collection and dissemination, seminars and workshops, and advertising and promotion programs.

Retailers of dairy products are members of the Retail Council of Canada (RCC) while consumers' interests are represented by the Consumers Association of Canada (CAC). Neither of these groups concentrates its efforts solely on the dairy industry. The RCC represents and supports the interests of all retailers, not simply those purveying dairy products, and similarly the CAC is there to serve the needs of all consumers of all products. It is perhaps significant that, whereas all 44,000 milk producers in the country are registered with the requisite provincial milk

marketing board/commission or the CDC or both, the membership in the CAC numbers is only about 50,000 out of a possible 25.5 million.

Principal Elements of Dairy Policy

The two main features of the policy for the Canadian dairy industry are regulation of supplies of milk reaching processing plants and support of income levels received by dairy farmers. These mainstays are supplemented by policies dealing with international trade aspects, such as import restrictions and export assistance/disposal (see overview, Figure 5).

Regulation of milk supplies is effected through quotas on both fluid milk and industrial milk and cream shipments. While fluid milk quotas are entirely a provincial jurisdictional matter, industrial shipments quotas are a joint federal-provincial concern. The CMSMC is the body responsible for determining aggregate quota levels of industrial milk and cream necessary to meet Canadian domestic and commercial export requirements. The same institution decides upon provincial allocations of the aggregate quota. With each province, the provincial share of the aggregate quota is allocated amongst individual producers by the provincial milk marketing board or commission. The quota system imposes a theoretical upper limit to an individual producer's shipments, but this limit can in practice be exceeded. In order to strengthen the quota system, stiff over-quota levies are exacted.

The focal point of income supports is the federal government's industrial milk target return, whose level is determined by a "Returns Adjustment Formula" (RAF). Components of the RAF are dairy cash costs of production (45 percent), the consumer price index as a proxy for returns to labour (35 percent), and a subjective judgement factor that includes an

Figure 5: Overview of Dairy Industry Policy Instruments

Jurisdictional Area	Policy Instrument: Supply Control	Income Supports	Import Constraints	Export Assistance
a) Federal		Offers to Purchase and key industrial Product Support Prices	Embargoes/ licenses (e.g. butter, skim milk powder)	Producer Levies
		Direct Subsidies		Direct Subsidies
		Industrial Milk Target Support Price	Quotas/ licenses (e.g. specialty Cheeses)	
		Returns Adjustment Formulae		
b) Federal-Provincial (CMSMC)	Aggregate Industrial Milk Quota			
c) Provincial				
	Individual Industrial Milk Quotas	Discriminatory Pricing		
	Fluid Milk Quotas	Provincial Pricing Formulae		

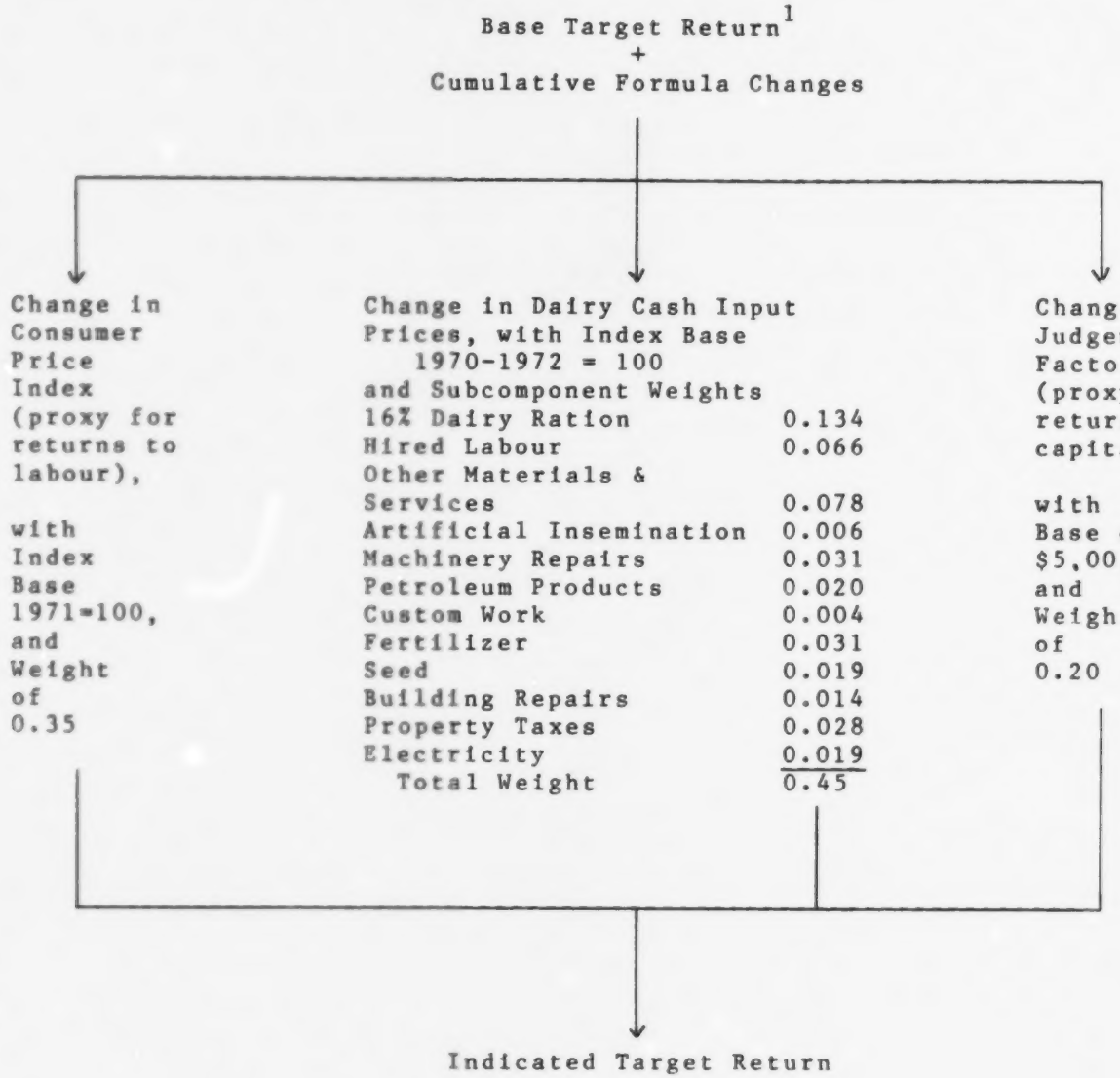
allowance for return to capital (20 percent) (Figure 6). Inaugurated in April 1975 with a base return level of 25 dollars per hectolitre of milk ($11.02 per cwt) subsequent increases have been triggered by the component parts of the RAF collectively reaching pre-specified threshold levels, with a maximum number (currently three) of adjustments being permitted per year. Proposals for a new pricing mechanism were submitted in a study completed in 1986 by Biggs and Lavigne, and implementation of any changes is expected to occur in 1987.

The target return for industrial milk is aptly named because it does not represent a guaranteed return level for industrial milk shippers. Actual prices paid to milk shippers are determined provincially in reference to the target return, and price levels generally differ among the provinces. Target returns are supported by two federal policy instruments: direct subsidy payments to producers, and support prices for key dairy products (Cheddar cheese, butter and skim milk powder) guaranteed through an offer-to-purchase scheme. Adjustments through the RAF to target returns in turn trigger the need for adjustments either to direct subsidy rates or to support prices. It is because dairy processing margins can only be estimated that returns to industrial milk shippers cannot be guaranteed: hence the use of the term "target return".

As in the case of industrial milk, prices paid to producers on fluid milk shipments are set by each province's marketing board/commission, typically in conjunction with a separate pricing formula.

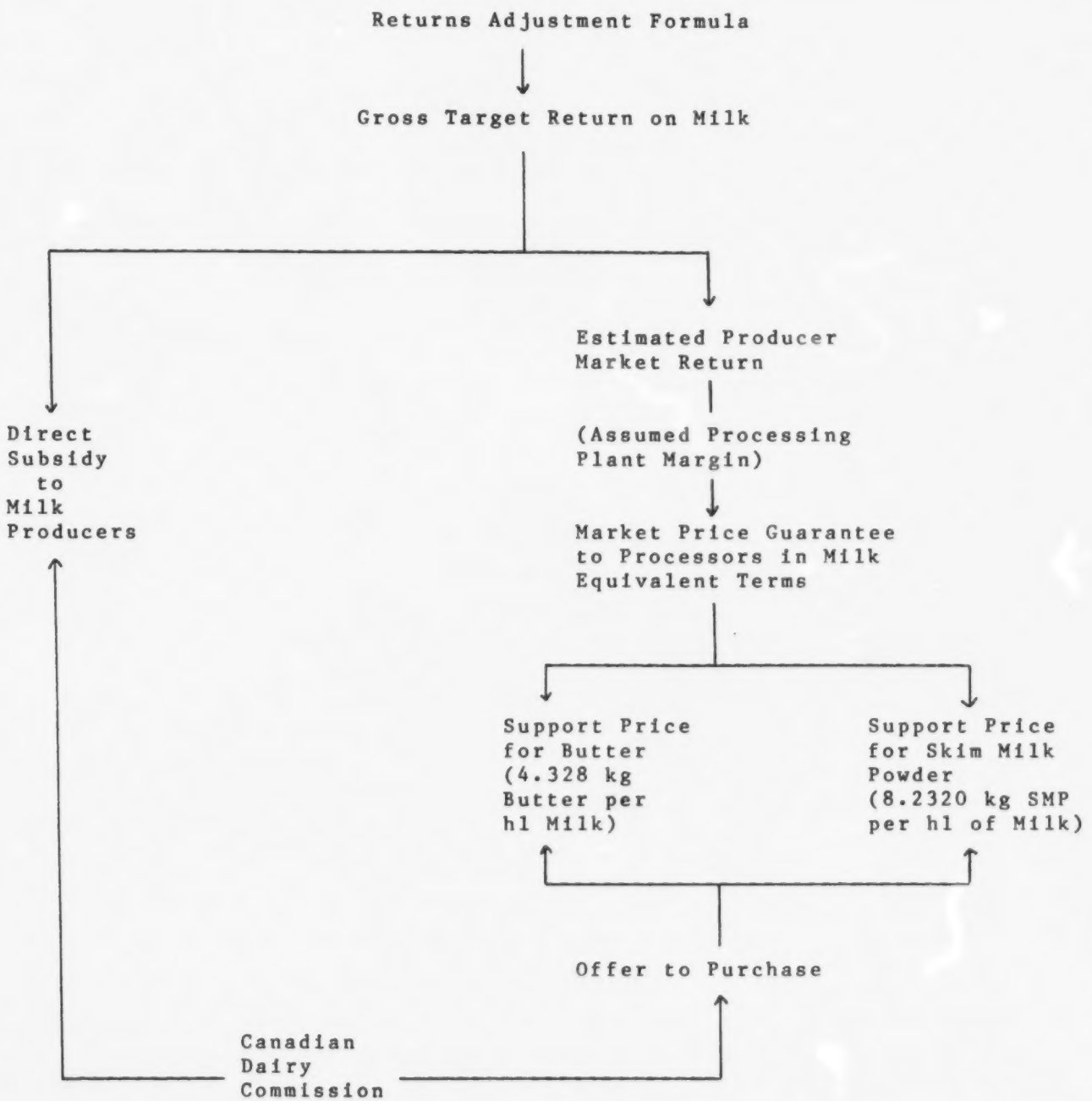
In order to operate the current dairy program effectively, Canadian-international trade must also be regulated.

Figure 6: Industrial Milk Target Returns Adjustment Formula


Base Target Return[1]
+
Cumulative Formula Changes
Change in Consumer Price Index (proxy for returns to labour), with Index Base 1971=100, and Weight of 0.35
Change in Dairy Cash Input Prices, with Index Base 1970-1972 = 100 and Subcomponent Weights
16% Dairy Ration 0.134
Hired Labour 0.066
Other Materials & Services 0.078
Artificial Insemination 0.006
Machinery Repairs 0.031
Petroleum Products 0.020
Custom Work 0.004
Fertilizer 0.031
Seed 0.019
Building Repairs 0.014
Property Taxes 0.028
Electricity 0.019
Total Weight 0.45
Change in Judgemental Factors[2] (proxy for returns to capital), with Base of $5.00/hl, and Weight of 0.20
Indicated Target Return

1 Set at $25.00 per hectolitre ($11.02 per cwt), April 1, 1975.
2 Includes reference to - changes in producer returns in other countries
- shifts in costs of processing dairy products
- fluctuations in inventory levels of dairy products

Figure 7: Industrial Milk Target Returns Adjustment Mechanism


Returns Adjustment Formula
Gross Target Return on Milk
Estimated Producer Market Return
(Assumed Processing Plant Margin)
Market Price Guarantee to Processors in Milk Equivalent Terms
Direct Subsidy to Milk Producers
Support Price for Butter (4.328 kg Butter per hl Milk)
Support Price for Skim Milk Powder (8.2320 kg SMP per hl of Milk)
Offer to Purchase
Canadian Dairy Commission

Several dairy products are included in the Import Control List and as such become subject to the licensing provisions of the Export-Import Permits Act. For casein, licenses are issued freely, but for most other products, licenses are only issued in response to a demonstrated domestic shortage. For butter, licenses for domestic imports are normally issued only to the CDC. Cheese import licenses are subject to a global quota of 20,400 tonnes per annum, and to the detailed provisions of several bilateral agreements.

Exports of Canadian dairy products generally require financial assistance, because as in the case of many other dairy exporting countries, prices of internationally-traded dairy products are considerably lower than domestic price levels. In order to finance the difference, Canadian producers are obliged to pay levies on all industrial milk produced within quota ($4.43 per hl in 1986-87); secondly, a special export levy is payable on all industrial milk destined for processing into products for exports, under a special export quota of 1.726 million hl in 1986-87 ($30.34 per hl in 1986-87); and thirdly, on milk delivered over quota limits, an over-quota levy is payable[7] ($38.00 per hl in 1986-87) (see Figure 9). Some assistance is also rendered by the federal government with direct subsidies paid on the first 1.1 million hl of milk destined for export. The direct subsidy rate of $6.03 per hl (actually paid on the basis of $1.675 per kg butterfat) matches that paid on all shipments of industrial milk delivered within quota for domestic use (44.9 million hl in 1985-86). No direct subsidies are paid on any shipments over quota. The combination of the lack of subsidy payment and the over-quota levy has the effect of reducing producer returns to the

[7] Over-quota levy is payable on shipments exceeding 100 percent of provincial quota utilization.

equivalent of world prices for butter and skim milk powder, thus acting as a disincentive to over production.

The policies and institutional arrangements reviewed above in general terms are next examined in somewhat greater detail.

The Canadian Dairy Commission

The federal government's policies for supply management and income support for the Canadian milk production sector are implemented exclusively through the CDC under the provisions of a 1966 Federal Act of Parliament. The many responsibilities of the CDC (Figure 8) include:

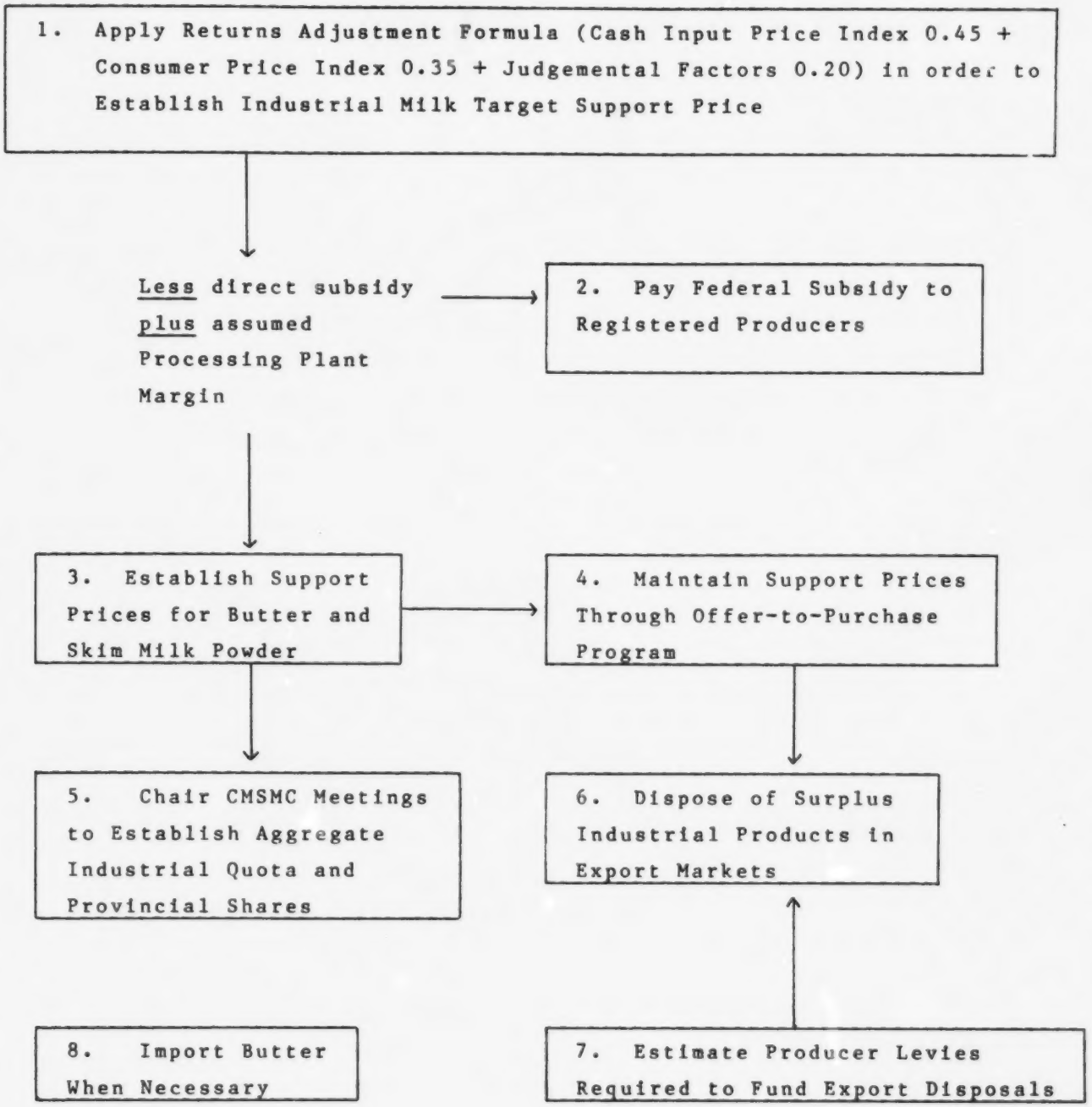
1. calculation and recommendation of changes in the industrial milk target support price, according to the returns adjustment formula (RAF) provisions;

2. payment of the federal direct subsidy to individual industrial milk and cream producers registered with the CDC for shipments within quota eligible for subsidy;

3. calculation and recommendation of support prices for key industrial products (butter and skim milk powder), based on the industrial milk target support price, given conversion rates of milk into butter and powder, the direct subsidy rate and an assumed processing plant margin per hl of milk processed;

4. maintenance of butter and skim msilk powder support prices through offering to purchase all product not immediately absorbed by the wholesale-ratail trade;

Figure 8: Responsibilities of the Canadian Dairy Commission


1. Apply Returns Adjustment Formula (Cash Input Price Index 0.45 + Consumer Price Index 0.35 + Judgemental Factors 0.20) in order to Establish Industrial Milk Target Support Price
Less direct subsidy plus assumed Processing Plant Margin
2. Pay Federal Subsidy to Registered Producers
3. Establish Support Prices for Butter and Skim Milk Powder
4. Maintain Support Prices Through Offer-to-Purchase Program
5. Chair CMSMC Meetings to Establish Aggregate Industrial Quota and Provincial Shares
6. Dispose of Surplus Industrial Products in Export Markets
8. Import Butter When Necessary
7. Estimate Producer Levies Required to Fund Export Disposals

5. chair the CMSMC bi-monthly meetings to establish aggregate industrial milk/cream quota required to fill estimated domestic and commercial export requirements, and to determine provincial shares of aggregate quota;

6. export marketing of dairy products, including those available as by-products of production for domestic butterfat needs, and those available from special export and other production;

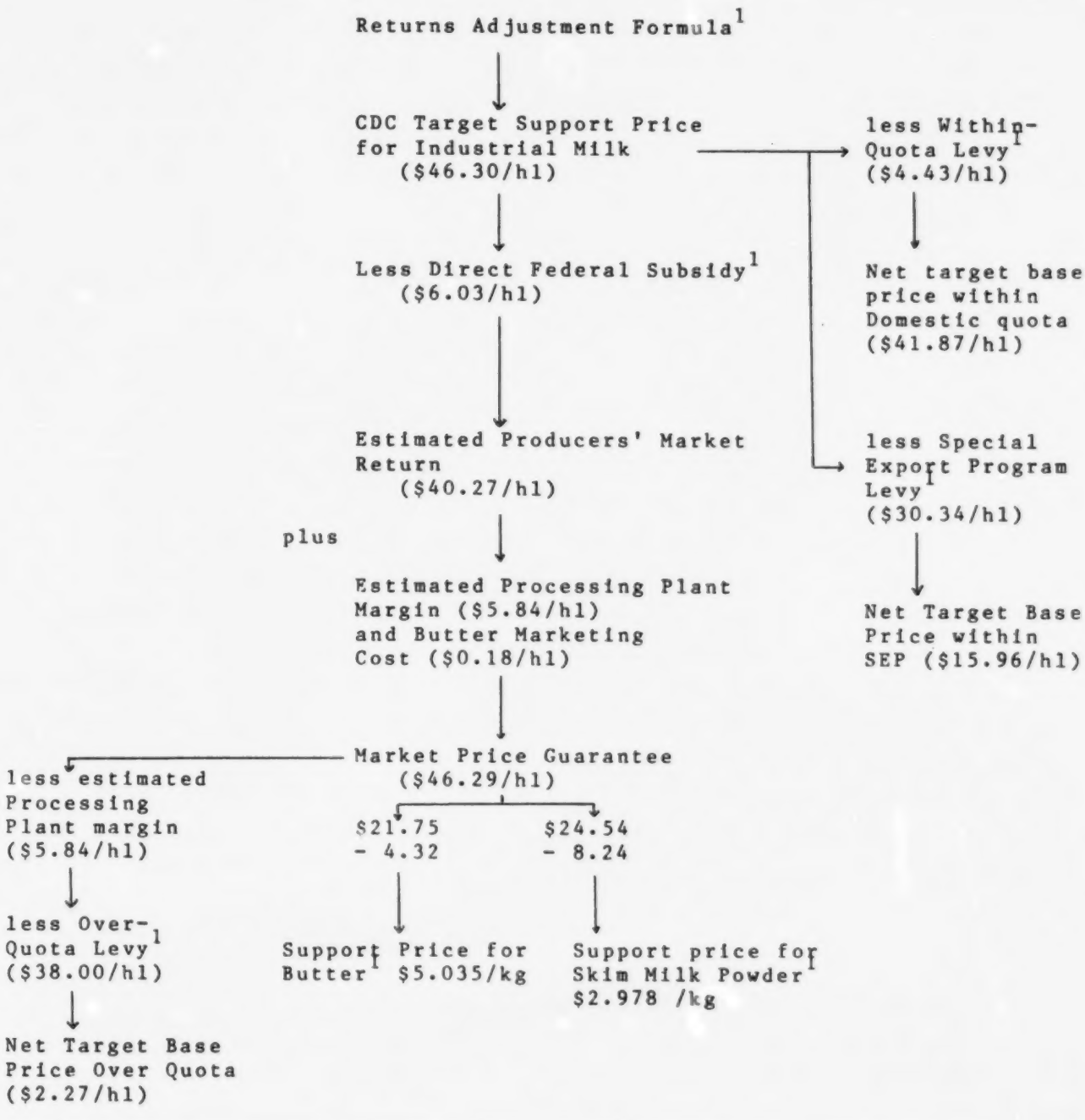
7. estimation of levy revenues required to support financially the export disposal of surplus products, and recommendation to the CMSMC of the rates for each of a) within-quota levies, b) special export program levies; c) over-quota levies;

8. importing of butter (for which the CDC is given first receivership on commercial quantities), when necessary, and/or issuing of import licences.

The above responsibilities of the CDC are presented in approximately the same order in which the CDC must deal with them. The administrative provisions associated with the RAF dictate the extent, frequency and timing of changes to the industrial milk target support price. Such changes can, in theory, be met by adjusting either the support prices for butter and skim milk powder or the direct subsidy to producers or some combination. In practice, the direct subsidy rate has remained unchanged at $1.675 per kg butterfat since 1975. Thus all subsequent changes to milk support prices have been absorbed fully by product support prices.

The translation from milk to the joint products, butter and skim milk powder, is not automatic in either technical or financial terms. Technically, yield rates may vary as a function of milk composition and technological improvements in processing plants. Financially, processing plants operate between negotiated

Figure 9: Canadian Industrial Milk Target Return Policy Instruments
December 1986


Returns Adjustment Formula[1]
CDC Target Support Price for Industrial Milk ($46.30/hl)
less Within-Quota Levy[1] ($4.43/hl)
Net target base price within Domestic quota ($41.87/hl)
Less Direct Federal Subsidy[1] ($6.03/hl)
Estimated Producers' Market Return ($40.27/hl)
less Special Export Program Levy[1] ($30.34/hl)
Net Target Base Price within SEP ($15.96/hl)
plus
Estimated Processing Plant Margin ($5.84/hl) and Butter Marketing Cost ($0.18/hl)
Market Price Guarantee ($46.29/hl)
less estimated Processing Plant margin ($5.84/hl)
$21.75 - 4.32
$24.54 - 8.24
less Over-Quota Levy[1] ($38.00/hl)
Support Price for Butter[1] $5.035/kg
Support price for Skim Milk Powder[1] $2.978 /kg
Net Target Base Price Over Quota ($2.27/hl)

1 Policy Instruments

or administered prices for milk and competitive market prices for products, and may thus make larger or smaller processing margin depending on competitive market forces. It is necessary for the CDC to estimate both the technical yields and the processor's margin, because the offer-to-purchase scheme requires the establishment explicity of support prices for butter and skim milk powder, while the RAF provisions call for explicit amendments to a "target" return for industrial milk. Although the target price may not be the actual price paid producers, it nevertheless must be established as a basis for further amendments through the RAF, as a base reference point for the actual prices paid to producers, and as a means of connecting RAF-based changes with required changes in product support prices. The various calculations involved in the industrial milk support price system are shown diagramatically in Figure 9.

The extent to which federal government direct subsidies contribute toward total incomes of dairy farmers has been declining since 1975, by virtue of constant unit subsidy rates, while support prices have been increasing. In 1965, government subsidies accounted for a modest 2.5 percent of total cash receipts from dairying (Table 11). By 1975, the subsidy contribution had risen to a peak of 14.2 percent, since then it has gradually declined to a level of 8.1 percent in 1985. Expressed in real (1981) dollar terms, federal subsidies have declined from 540 million dollars in 1975 to 210.7 million dollars in 1985, so that, while still an important income supporting and stabilizing element, their relative importance is diminishing.[8]

[8] Although the importance of direct subsidies is declining, the overall value of federal government programmes in terms of regulation through quota and import restrictions, as well as subsidies, has increased in the period 1965 to 1985.

Provincial Marketing Boards/Commissions

Milk producers in each individual province are represented by a milk marketing board or milk commission created through provincial enabling legislation. Every producer selling milk off the farm must register with and receive a licence from the board/commission, which in most cases, also acts as sole purchaser of all commercial milk.

Each provincial board/commission is responsible for a number of activities concerning the production and marketing of milk within its boundaries. Firstly, production levels are regulated through quotas allocated to individual producers from the provincial share of national quota allotted by the CMSMC. In many provinces, quota can be traded at market-established prices based on bids to purchase and others to sell on monthly exchanges administered by the marketing board/commission. Each producer has the option, subject to meeting licencing and quality requirements, to ship milk to either or both of the fluid or industrial milk markets, but quota must be obtained separately for each market. In Ontario, where a quota exchange has been in operation the longest of any province, only about two percent of quota is traded in a typical month, and about one-half of traded quota represents inter-generational transfers within a family. Since the latter are allowed at no cost, there is a very small basis for establishing prices of quota on the monthly exchange.

Secondly, all producers and processing plants operating within its jurisdictional area must abide by health and hygiene regulations set by the provincial authorities.

Thirdly, the board/commission is responsible for making the arrangements for collection and delivery of milk within its provincial boundaries, for collection of transportation charges from producers and for payment to the transportation companies.

Fourthly, the board/commission is empowered to set prices that processing plants must pay producers for milk destined for different uses. This permits discriminatory pricing to be practised, whereby plants processing milk into fluid milks and table creams, are obliged to pay higher unit prices for their raw material than processing plants producing ice cream and yogurt, which in turn must pay a higher price than plants producing cheeses. Typically milk used for producing butter and skim milk powder commands the lowest unit price (Table 18) because these joint products are the least perishable of dairy products, are therefore treated as residual products which are manufactured only when production of all other dairy products has reached a level estimated to satisfy domestic and commercial export requirements. In some provinces, the allocation of available milk supplies amongst processing plants producing different dairy products is more rigidly defined through quotas issued to processing plants; in Ontario for example, these are referred to as "plant supply quotas".

Fifthly, the provincial boards/ commissions frequently undertake advertising and promotion campaigns, mostly for the fluid milks and table creams which are produced and sold almost exclusively within provincial boundaries. Finally, each province's board/commission collects from its own producers the levies agreed to by the CMSMC. Levy proceeds are forwarded to the CDC, whose responsibility it is to ensure that enough monies are collected to meet its financial commitments in respect of products destined for export.

TABLE 18: Milk Prices Paid by Processing Plants to Marketing Boards or Commissions, by Milk Class, Ontario and Quebec, December 1985

($ per hl milk, containing 3.6 kg butterfat)

Ontario		Quebec	
Class 1		Class 1	
(fluid)	52.51	("standard" fluid)	50.96
Class 2		Class 2	
(concentrated liquid milk)	51.51	(low-fat milks, fluid creams)	43.63
Class 3		Class 3	
(fluid creams, cottage cheese, yogurt)	43.54	(ice cream, cottage cheese, yogurt)	40.10
Class 4		Class 4	
(ice cream, milk shakes, puddings, soups, infant foods)	43.20	(cheeses manufactured by independent processing plant; grated cheeses prepared by cooperative plants	39.90
Class 4a		Class 5	
(specialty cheeses)	41.45	(cheddar and specialty cheeses manufactured by cooperative plants; butter, powdered and, concentrated milk products manufactured by all types of plants	39.65
Class 4b			
(brick and colby cheeses)	41.45		
Class 4c			
(sterilized milk for export)	43.20		
Class 5			
(butter, casein, powdered and concentrated milk products)	39.43		
Class 5a			
(cheddar cheese)	39.86		
Class 6			
(new products)	39.43		

SOURCE: Agriculture Canada, Dairy Market Report.

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